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The Early Cartography of the Pacific

By LAWRENCE C. WROTH

INTRODUCTION

THE great extent of the Pacific and Indian Oceans was a fact of world geography which had to be learned by most of us, or learned anew, after the outbreak of the war with the Japanese. The distances from one shore line to another or from one to another of the island groups or scattered islands seemed all but unbelievable to those whose interests had not recently led them into that spacious ocean world. Through this realization of ignorance was born a lively curiosity which led to the asking of questions about the discovery and exploration, political history, and historical cartography of the scene of the war in the Far East. Certain of these questions addressed to The John Carter Brown Library were of the sort that could best be answered through the graphic display of data in the form of early maps of the area. Accordingly in the spring of 1943 the Library put on an exhibition entitled *The Pacific Battleground: a Selection of Maps Illustrating the Geography of the Pacific and Indian Oceans from Alexander the Great to Captain Cook*.

No single library possesses all the maps essential to the purpose implied in the title of the John Carter Brown exhibition. The Library made use, therefore, of facsimiles of maps in other collections of Europe and America when these seemed important in the development of the subject. The exhibition became a coöperative enterprise and the list of its contents a selective map list rather

than the record of the possessions of a single institution. In like manner this commentary * which began as a brief descriptive account of the maps actually displayed has become an attempt to relate in a concise and ordered manner the history of the significant voyages, the dreams, the frustrations, the chimerical imaginings through which the Pacific and Indian Ocean areas became known to the western world.

Though this account of the maps of the Far East and its appended list of the maps themselves form what may be called a "timely publication," its purpose is broader than is usually implied by that term. It is written in the conviction, not an uncommon one today, that a new world has thrust itself into the consciousness of Americans and Europeans and that it is there to stay, affecting their public policies and their private interests more importantly than ever before in recorded history.

An examination of the author's correspondence files would reveal a formidable list of individuals to whom he is under obligation for assistance. Though the name of Henry R. Wagner is not among them, it is his works on the Pacific Northwest, specifically mentioned throughout the notes, that must first receive the tribute of thanks. Aid has been accorded in many particulars by Colonel Lawrence Martin and Mrs. Clara Egli Le Gear, of the Library of Congress; Mr. John K. Wright of the American Geographical Society; Mr. Avrahm Yarmolinsky of The New York Public Library; Mr. George H. Beans of Jenkintown, Pennsylvania; and Miss Margaret Stillwell of The Annmary Brown Memorial. Miss Belle da Costa Greene on behalf of the Trustees of The Pierpont Morgan Library, has given permission for the reproduction of the Beatus map in Morgan Ms. 644. Mr. Curt F. Bühler of that Library has been most helpful in all that pertains to the account given of the Beatus map. Mr. Thomas W.

* Read before the Bibliographical Society of America, in much less expanded form, at its meeting in New York, June 18, 1943.

Streeter, of Morristown, New Jersey, has given not only encouragement but from the beginning of the study has supplied information and has loaned for examination three maps from his own extraordinary collection. In connection with the section dealing with the ancient world, suggestions and important criticisms have been received from Professors Benjamin Crocker Clough, Charles Alexander Robinson, and Charles Arthur Lynch of the Brown University Classics Department. Professor Carl W. Miller of the Physics Department at Brown has been a helpful adviser in the difficulties which arose in the course of photographing the maps by which the study is illustrated. The maps chosen for reproduction proved in many instances to be less photogenic than we had hoped, but their refractoriness was overcome through the aid of Professor Miller and the assiduity of Mr. Woodley L. Wright, technical assistant on the John Carter Brown staff. To the other members of that staff, as always under similar circumstances, the author acknowledges deep obligation—to Miss Marion Adams for generous helpfulness at every stage of the work, to Miss Jeanette Black for a complete editing of the manuscript, pertinent criticism, and a careful examination and weighing of statements of the first importance in the result. The Committee of Management of the Library has allowed the author and his assistants to give extensively of their time in the preparation of the study and has given permission for the reproduction of the maps designated as belonging to The John Carter Brown Library.

If this study carried a dedication it would stand in the name of the author's friend, Major Robert W. Kenny, 103d Field Artillery, USA, who for nearly two years has been an actor in the greatest of all Pacific adventures, concerning himself in many harsh and distant places with matters which, superficially, have little connection with his former duties as an assistant professor of English in Brown University. Though by design hardly a word of the War has found its way into the ensuing narrative, there has

been no moment in its writing in which Robert Kenny and his fellows in the South Pacific have been absent from the author's consciousness. Nor will they, or others of their indomitable sort, ever be out of the minds of those who read this account of the Pacific discoveries and their mapping.

I. BEFORE THE GREAT DISCOVERIES:
FROM CLAUDIUS PTOLEMY TO MARTIN BEHAIM

THE European maps which have come down from the centuries before the Discovery Period fall into three broad categories—the maps of Claudius Ptolemy, the ecclesiastical maps, and the portolan charts, respectively the learned, the popular, and the utilitarian modes of representing on a plane the picture of the earth and its parts. Throughout the first fifteen centuries of the Christian era these three distinct types of map production are seen as parallel streams of which the first served the scholar, the second the uncritical people, and the third the mariner. The scientific map of Claudius Ptolemy and the utilitarian portolan chart have become, through a natural evolution, the land map and the sea chart in common use today. They survived and developed because the scientific production learned to go to the utilitarian for its subject matter, while the utilitarian borrowed from the scientific its learned system of construction. The ecclesiastical map underwent a certain degree of development in the embodiment of new geographical data, but it remained throughout its history unaffected by the superior construction of the other forms, and was without influence upon their evolution. It had its origin in the primitive geographical conceptions of the ancient Greek world, and it retained its archaic form throughout the three thousand years or so of its currency. In this opening chapter of our discussion we shall be looking at Africa, the Indian Ocean, and eastern Asia successively through the eyes of Claudius Ptolemy, the churchmen who created the ecclesiastical maps, and the makers of the portolan charts.

The Maps of Claudius Ptolemy

The *Geography* of Claudius Ptolemy of Alexandria was first given printed publication at Vicenza in 1475; its earliest edition with maps was that which appeared at Bologna in 1477, bearing

the incorrect date, 1462 (No. 13). The world map in that book and the map of eastern Asia, entitled in later editions *Undecima Asie tabula*, displayed no greater knowledge of the Far East than had been embodied in them when they were first constructed by the Alexandrian geographer about 150 A.D.¹ In the world map of 1477 as in those of all fifteenth-century editions of the *Geography*, the far eastern extremity of Asia is shown throughout its length as unbroken land, bounded by a meridian running about fifteen degrees east of the Malay Peninsula. This was Ptolemy's 180° east longitude,² the eastern limit of his Oikoumene, the inhabited world of Europe, Asia, and northern Africa, so far as revealed to him and the men of his day. Beyond that meridian lay unknown land. Ptolemy knew the world was round and that somewhere to the east of that unknown and very extensive area lay a great ocean. He must have believed, as Columbus believed later, that this was the ocean which washed the western coast of Europe, but as the whereabouts and shape of its eastern or Asiatic shore were unknown to him he eschewed guesswork and left out of his world picture the unknown land and unknown sea of eastern Asia, making his boundary the sharpest and most definite possible, that is, a meridian of longitude.

The Land-Enclosed Indian Ocean

In another aspect of his eastern picture Ptolemy displays what may seem a perversion of truth rather than ignorance or exces-

¹ It has been generally accepted that the maps in the existing manuscripts and early printed editions of the *Geography* go back to Ptolemy himself. From this general statement Father Joseph Fischer in Stevenson, *Ptolemy*, Introduction, p. 5, et seq., excepts the all-important world map, which in his opinion was constructed by Agathodaemon, an Alexandrian geographer and an early editor of Ptolemy. Nordenskiöld, *Facsimile-Atlas*, p. 8, discounts the part of Agathodaemon in the making of the sectional maps of the *Geography* but is not specific on the question of the world map. But whatever may be said it is clear that in its main features the world map is the graphic expression of Ptolemy's text, especially of Books I and VII. Because of this circumstance it seems proper to refer to the mappemonde in the *Geography* as the Ptolemaic world map.

² Actually the engraver of the world map of 1477 has marked incorrectly the meridians beyond 145°, so that the last meridian reads 190 instead of 180. A more

sive caution. Upon his world map, a land mass bearing the legend "Terra incognita" runs due east from Africa at 15° south latitude and joins a non-existent southward extension of eastern Asia, specifically of that section we call today Indo-China, having at its southern extremity Cambodia and Cochin-China. This concurrence of imaginary land masses unites the continents of Africa and Asia and makes of the Indian Ocean a land-enclosed sea. (Plate I.) Such a conception of the Indian Ocean was not, however, a new and radical theory advanced by the Alexandrian geographer. Its statement in his text and its portrayal upon his world map present a notable instance of the length to which a scholar will go in the application of an hypothesis. The Homeric conception of the world as a flat, circular disc of land surrounded by a continuous ocean stream remained a popular notion in the Greek world even after many philosophers and scientists had accepted the theory of the sphericity of the earth enunciated by the Pythagoreans and subjected to theoretical proof by Aristotle. That new theory raised the question of the comparative extent and weight of the land and water masses of the world and their distribution with respect to one another. One school of scientists maintained the continuous ocean theory of the older Greek world, asserting that on the sphere, as on the flat disc postulated by their forefathers, the land mass of the known world was encompassed by confluent oceans. In their conception the Atlantic Ocean, the Arctic, and the Indian Ocean merged to form a single body of water which surrounded the continents of Europe, Asia, and Africa. In the second century B.C., however, the continuous ocean theory was questioned by Hipparchus, who set forth in place of it the hypothesis of land-enclosed oceans, the great marine basins of the Atlantic and Indian Oceans, the Mediterranean, and the Caspian Seas.⁸

satisfactory rendering of the map is found in the edition of Ulm, 1482 (Plate I), and references hereafter will be to that map rather than to the earlier one of 1477.

⁸ Hipparchus, astronomer and general scientist of the second century B.C., was not the inventor of the theory of land-enclosed oceans but merely its outstanding proponent, who put it into circulation and invested it with his authority. Before his time

Marinus of Tyre, the celebrated geographer of the first century A.D., accepted the Hipparchian hypothesis, and Ptolemy, obedient to these forerunners and masters of his thought, gave it the weight of his authority.⁴

The Eastward Extension of Africa

The incorrect southward extension of eastern Asia which we observe upon the world map of Ptolemy was a tradition of the Alexandrian school of geographers which he accepted without question. The extension of Africa eastward to a junction with the false Asiatic projection seems also to have been a part of his heritage from the past. It will be interesting to seek the origin of that notion. In the era of Hipparchus, three centuries before Ptolemy's time, the Egyptian Greeks, intermediaries in the commerce between Europe and Asia, knew the eastern coast of Africa chiefly from voyages made upon the Red Sea. Sailing the length of that body of water from ports near its head they had upon their right hand an African coast which turned sharply to the east beyond the Strait of Bab-el-Mandeb and ran in that direction until it reached the Indian Ocean at Capè Guardafui. But the voyages of these men of the second and third centuries B.C. did not carry them far beyond the Strait, certainly not often as far as Cape Guardafui. Their business was to meet at Moosa in Yemen on the Red Sea the Arab traders who brought to them at that place the wares of India and even of lands beyond the Ganges. It was the policy of the Arabs, firmly maintained for centuries, to discourage whatever inclination the Egyptians may have had towards the establishment of direct trade relations with the people of those dis-

it had been mentioned as a not too unbelievable current theory by Aristotle, who, however, in another work expressly made denial of its possibility. Much curious and rich learning has gone into the discussion of this subject. See particularly A. -J. Le-tronne, *Discussion de l'Opinion d'Hipparque sur le Prolongement de L'Afrique au Sud de L'Équateur*, in: *Oeuvres Choiesies*, 2d Series, Paris, 1883, I, pp. 316-336.

⁴ This ancient controversy is admirably summarized in the early chapters of Rainaud, *Le Continent austral*, Paris, 1893.

tant countries.⁵ The southern shore of the Gulf of Aden was hardly known to them, therefore, from personal experience. They knew of its easterly direction beyond Bab-el-Mandeb, but until about 100 B.C. they did not know, nor were they told by the Arabs, that at Guardafui the African coast made a right-angle turn southward and thereafter ran for some thousands of miles in a general southwesterly direction.⁶ Not knowing of its change of direction they must have conceived of it as continuing indefinitely its eastward trend. What the traders and mariners may have suspected we do not know, but it is plain that the geographers found it easy to let that coast run eastward in their imaginations until it met the equally false southern extension of the Asiatic coast which tradition had placed upon their maps. Such a solution was especially easy for the followers of Hipparchus, committed to the theory of land-enclosed oceans. This conception was accepted by Marinus of Tyre and from him was taken over by Ptolemy. But Marinus and Ptolemy expressed it with a difference, for by their time conditions had changed. The power of the Arabs had weakened, and the men of Egypt were customarily voyaging to Cape Guardafui, rounding its corner, and progressing south and southwest along the Indian Ocean coast of Africa as far as Rhapta at about 8° south latitude. They had knowledge, furthermore, of the promontory called Prasum five degrees further south. Ptolemy portrayed this new data upon his maps, but unfortunately for his reputation as a geographer he was not satisfied to record only

⁵ William Vincent, *The Periplus of the Erythrean Sea . . . Containing an Account of the Navigation of the Ancients*, London, 1800, 2v., *Preliminary Disquisitions*, and Cary & Warmington, pp. 67-73, discuss the commercial relations of the Egyptian Greeks with the Arab world and the extent of their voyages.

⁶ Towards the end of the second century B.C., about the year 115 of that era, Eudoxus, returning from India to Egypt, was blown out of his course along the Arabian coast and driven southward down the African coast below Cape Guardafui. It was probably because of his report of this event that "Artemidorus, writing about 100 B.C. could know that the African coast turned around at the 'Southern Horn,' that is, Guardafui, though he stated that nothing was really known of the coast beyond that headland." See Cary & Warmington, pp. 70-71, with their supporting references to Strabo.

what he knew to be fact, the knowledge acquired from the actual experience of the mariners and traders of the two centuries preceding his day. He had a tradition and an inherited theory to maintain. In his obdurate attachment to the tradition of an eastward extension of Africa and to the theory of land-enclosed oceans, he made a ninety-degree change of direction at Prasum and carried his African coast eastward across the Indian Ocean until it joined the imaginary southward extension of Asia at the place called Cat-tigara.

The Ptolemaic Ideas contradicted by other Evidence

It has been suggested by all who have given thought to the subject that when Ptolemy compiled his book and maps in the middle of the second century A.D. there was current along the docks and in the warehouses of Egypt and Mediterranean Europe fuller information than he recorded about the Indian Ocean and its shores. It seems, indeed, that knowing so much he might have known more, that he might, indeed, have known as much as his predecessor, the anonymous Egyptian-Greek merchant who about 60 A.D. composed for the mariners and traders of his time the work we know as *The Periplus of the Erythraean Sea*. One of the routes detailed in that book of sailing directions leads us down the Red Sea, through the Gulf of Aden, around Cape Guardafui, and southward to Rhapta, situated, as already said, on the east coast of Africa at about 8° south latitude. Describing Rhapta and other neighboring markets along that coast, the author of the *Periplus* writes: “. . . beyond these places the unexplored ocean curves around toward the west, and running along by the regions to the south of Aethiopia and Libya and Africa, it mingles with the western sea.”⁷ Ptolemy could also have known the account given by Herodotus of the circumnavigation of Africa in the seventh century B.C. by Phoenicians sent forth by Necho, King of Egypt,⁸

⁷ Schoff, *Periplus*, p. 29, sec. 18.

⁸ Cary & Warmington, pp. 87-95, discuss fully the tradition of the circumnavigation as recorded by Herodotus, deciding that the evidence is favorable to its acceptance but with a final verdict of “not proven.”

and he might have learned from Strabo and Pliny of the attempt of Eudoxus to make that navigation from west to east, inspired by the rumor that the Phoenicians in Spain followed that route to Somali and Arabia in order to be free of the intermediation in their trade of the Ptolemaic rulers of Egypt.⁹ But these stories of a circumnavigation of Africa were tradition and hearsay and, in his consideration, of little weight against the belief of Hipparchus and Marinus of Tyre that the Indian Ocean was cut off from the Atlantic by an African barrier.

Alexander's conquest of India had disclosed an empire rich in possibilities of trade, and the rulers of the Greek state which he had set up in Egypt persisted in their efforts to establish a direct route to the Indus by way of the Red Sea and the Indian Ocean. Those efforts, as we have seen, were long frustrated by the insistence of the Arab upon his position as carrier and middleman. But by the second century B.C. we find the Ptolemies sending their ships beyond the Strait of Bab-el-Mandeb to trade along the Arabian coast and even, in B.C. 120 and 115, sending Eudoxus to India upon independent voyages. But in proportion as the Arab dominance began to weaken at this time so did the energy of the Ptolemies. They were kept out of the Persian Gulf by the Seleucids of Syria, the rival Greek rulers in Asia, and, when the Seleucid power had waned, by the Parthians. Decayed though it was, the Arab power remained sufficiently great to prevent their sailing to Guardafui. A change of great moment occurred, therefore, in the history of this commerce between East and West when in 30 B.C. Egypt came under the rule of Rome. Roman money and Roman enterprise gave it new life. The Egyptian fleets in the reign of Augustus went both to India and to Guardafui and beyond, and there was instituted at once a new era in world commerce which was to endure until the close of the second century A.D., when all things Roman suffered a decline.¹⁰

⁹ Cary & Warmington, pp. 97-103.

¹⁰ Cary & Warmington, Chapter IV, *Indian Waters*, give a summarized account of the trade of Europe and Egypt with India.

Sometime in the course of this ceaseless effort by the Egyptians to reach India occurred an event, or a series of events, which immensely facilitated the navigation upon which their commerce rested. The Indian voyages of Eudoxus in 120 and 115 B.C. were coasting voyages of a tedious character. It was inevitable that sooner or later someone would strike out boldly on a direct course from Bab-el-Mandeb to the Indian peninsula, riding before the southwest monsoon that blew steadily from May to October. It is commonly said that this feat was accomplished by the Greek mariner Hippalus, who about 47 A.D. made the first voyage from the Arabian coast across the upper part of the Arabian Gulf direct to the mouth of the Indus, carried thither rapidly and with comfort by the monsoon. The historians who fix this date for the Hippalus voyage add that by 50 A.D. a succession of experimental voyages had resulted in even more direct courses across the Gulf, from Bab-el-Mandeb or from Guardafui, and in landfalls farther and farther south on the Indian coast until the port customarily attained was Muziris, now Cranganore, a town near the tip of the great peninsula.¹¹ All this was before the time of Ptolemy the geographer. Because of it the shape of India was known to his contemporaries. Strangely, it seems to have been concealed from him. His portrayal of that land upon his maps seems to go little beyond the knowledge attained through the voyage of Nearchus from the mouth of the Indus to the head of the Persian Gulf, made four centuries earlier at the behest of Alexander the Great.

But Ptolemy's eastward extension of the African coast and his failure to portray India as a peninsula are not the only evidences

¹¹ From a recent discussion of this historic navigation found in W. W. Tarn, *The Greeks in Bactria & India*, Cambridge, 1938, pp. 368-369, the probability is made clear that the record of this achievement has been too greatly simplified in its statement and that the series of voyages direct to India began much earlier and was spread over a longer period of time. Tarn agrees that the final achievement, the voyage from the Somali coast to Muziris, occurred as usually stated sometime in the period A.D. 40-50, but, citing Pliny, makes it clear that this stage in the navigation was preceded by two others. He carries back to the period 90-80 B.C. for the first use of the monsoon in this navigation, and suggests that this first use was simply "cutting across a bit of open sea from a point in Arabia which he [Pliny] calls Syagros to Demetrias-Patala."

we have that the world map of the Alexandrian was an unsatisfactory record of the geographical knowledge of his day. In the course of the enlarged commerce which followed the discovery by Hippalus of the direct course to India, a mariner named Alexander coasted the eastern shores of the Indian peninsula, rode the monsoon across the Bay of Bengal to Lower Burma, sailed thence southward along the Malay Peninsula, found, and passed through, the Strait of Malacca, and continued northward by way of the Gulf of Siam to Cambodia and Cochin-China and probably beyond.¹² The end of Alexander's voyage was the city of Cattigara, the exact location of which is uncertain.¹³ What is certain is that Cattigara did not lie where Ptolemy had placed it, that is, on the Indian Ocean at 10° south latitude, marking the spot, so to speak, where his imaginary African and Asiatic extensions join. Ptolemy knew of this voyage to Cattigara made by Alexander the Mariner. In his *Geography*¹⁴ he discussed the account of it he had received from Marinus of Tyre, but neither that account nor his own acumen led him to realize that Alexander had found an outlet from the Indian Ocean to the seas beyond.

There must, indeed, have grown out of the trade which followed the voyages of Hippalus and Alexander a body of knowledge sufficiently full and exact to permit Ptolemy to free the Indian Ocean from the southern barrier he gave it upon his world map, and to open a way from it into the seas which washed the eastern coast of Asia. *The Periplus of the Erythraean Sea* offers other testimony that such knowledge existed in Ptolemy's day, or, certainly, that it had existed shortly before. The author of the *Peri-*

¹² Cary & Warmington, pp. 82-83. The date of the exploit of Alexander the Mariner seems uncertain, but Ptolemy, Book I, Chapter XIV, quotes Marinus of Tyre, living in the first century A.D., as citing this voyage.

¹³ Lelewel, section *Cartes de l'Inde*, pp. 14-15, cites authorities who locate Cattigara on the Cambodian coast or on the coast of Cochin-China. Cary & Warmington, pp. 82-83, place it farther north, inland from the Gulf of Tongking, identifying it with the town of Hanoi. Lawrence Martin, in: *Annual Report of the Librarian of Congress*, 1943, p. 131, locates it at Canton.

¹⁴ Stevenson, *Ptolemy*, Book I, Chapter XIV.

plus seems to have believed not only that the Indian Ocean joined the Atlantic at the south of Africa, but that, sailing its eastern extremity, one might pass to "the sea outside ending in a land called This," whence were brought raw silk, silk yarn, and silk cloth.¹⁵ Ptolemy could have known the *Periplus* with its account of an unobstructed eastern coast of Africa, its record of the exploit of Hippalus, and its assumption of a passage from the Indian Ocean to the China Sea, but it is by no means certain that he did know a book which in his day, a full hundred years later, may have lost whatever degree of currency it once possessed.¹⁶ But one may go too far, may rest too heavily upon the vagaries and the sins of omission of the Alexandrian geographer. One need not, in truth, apologize either for the vagaries or for him. Whatever his sins, however rigid his theories, he remains the father of modern geography, the scientist who forced upon the world a cartographic system which takes into account the problems involved in projecting a sphere upon a plane and brought into common use the practice of locating places by reference to their latitude and longitude.

The Ptolemaic Revival

If there were reasons, as set forth in the foregoing section, for thinking of Ptolemy's portrayal of the Indian Ocean and its coasts as anachronistic even in the second century of the Christian era, how much more potent are those which apply to the editions of the great work printed without addition, gloss, or amendment in text or maps in the last quarter of the fifteenth century! This comment need not be interpreted as derogatory to the skill and intelligence of the fifteenth-century editors of the book. It is a fair generalization to assert that the early recensions of ancient works in that and the preceding century were concerned chiefly

¹⁵ Schoff, *Periplus*, p. 48.

¹⁶ Vincent (work cited in Note 5), pp. 52-53, argues with force that Ptolemy did not know the *Periplus*, saying in effect that in the century between its compilation and the time of Ptolemy's activity a book existing only in manuscripts made for traders and mariners might well have disappeared from view and knowledge.

with the presentation of the texts as received from the past. For those first scholars, warm with enthusiasm for the reborn knowledge, it was enough to collate and organize the records of the ancient culture every day being brought to light in the libraries of monasteries, princes, and savants. Criticism, emendation, and development would come in due course.

But even with so much said by way of extenuation, it sometimes seems that the fundamentalism, the reverence for the received text, displayed by the Renaissance scholar was carried to an extreme by the early editors of Ptolemy. Since the Alexandrian's day much had been added to the world's store of geographical knowledge when in the year 1410 Jacobus Angelus made the first translation of the *Geography* into the Latin. For one thing the Arab in that period had become a great figure in the world. Stimulated by his new and militant religion, he began in the seventh century the dissemination of his faith and the enlargement of his political and economic life. Rome and Constantinople were no longer the mistresses of the world. The Moslem had pushed his conquests to the East and the West. Once more he was the merchant and carrier of the Indian Ocean, the freighter of merchandise between Asia and Europe, and the agent and middleman in that difficult commerce. It would have been strange if those far-wandering traders, sailors, and men-at-arms, bridging the continents by their conquests, had not carried to their European kingdoms some notion, however vague, of the lands and seas and peoples which lay beyond their stations on the African coast and eastward of their empire in India. And yet it is a fact that little knowledge of the world is found upon the Arab maps which have come down to us that had not been recorded centuries earlier by Ptolemy. Norden-skiöld suggests in his *Periplus* that what was best in their maps was but Ptolemy in debased form. He has only mild praise even for the much lauded maps of Edrisi, the one engraved in circular form upon a silver plate for Roger II of Sicily in 1154, and the other a plane map of seventy sheets (No. 3) made about the same

time to accompany the Arab scholar's own work, a detailed description of the known world. In our present interest, however, those maps deserve consideration, for they show an honest, if not always successful, effort to ascertain and record geographic truth, and furthermore they correct the errors of Ptolemy in one important particular. Edrisi retains on his plane map the southern land boundary of the Indian Ocean, but he has done away with the false southern extension of the coast of Asia and has opened the Indian Ocean to the eastern seas. His display of islands in the neighborhood of the Malay Peninsula shows plainly that an inquiring mind had been at work seeking information for a clear graphic record of that area. It has been pointed out that the place names upon this map are those employed in the tales of Sinbad the Sailor, hero of the *Arabian Nights*. There is a plausible literary theory that the Sinbad story was not wholly a creation of the artistic imagination, but that in the adventures of this fictional personage is found summarized the experience of many generations of Arab traders and mariners in the isles and seas of the eastern Indian Ocean.¹⁷

Until recent years we might have brought forward at this point a map which would have demonstrated most satisfactorily the possession by the Renaissance world of full knowledge of the shape of Africa and the confluence south of it of the Indian and Atlantic Oceans. There was constructed in 1351 the portolan atlas which Nordenskiöld designates as the *Atlante Mediceo* (No. 7) and acclaims as a work of extraordinary significance. The map of Africa in this notable work shows that continent, more than a century before Bartholomeu Dias rounded the Cape of Good Hope, as a great southward-reaching peninsula thrust between the Atlantic and Indian Oceans. Since Nordenskiöld's time, however, close ex-

¹⁷ R. H. Major, *India in the Fifteenth Century*, London, Hakluyt Society, 1857, pp. xxx-xlv, refers to the Baron Walckenaer's pronouncement of the geographical importance of the Sinbad cycle, with its synthesis of the experience of many Arab travellers, citing Walckenaer in *Nouvelles Annales des Voyages*, Volume liii, p. 6. See also M. B. Synge, *A Book of Discovery*, pp. 101-106.

amination of this treasure of the Laurentian Library at Florence has shown that its portrayal of the southern portion of the continent is an addition of a later draughtsman.¹⁸ Just when this revision of the map was accomplished seems uncertain. In all probability the addition was made as the result of an increasing assurance on the part of the Portuguese of the early fifteenth century that Africa was in fact such a peninsula as we now know it to be. But whatever the explanation may be of this alteration in outlines, the map which suffered it may no longer be received as evidence that fourteenth-century Europeans were aware of the peninsular form of that continent. More than a century elapsed after the construction of the *Atlante Mediceo* map before, in two maps of 1457 and 1459, Africa was so drawn as to leave little doubt that its peninsular character was understood by the cartographers responsible for the delineation. In the Genoese World Map (No. 11) and the Fra Mauro Map (No. 12), the Indian Ocean is shown as an open sea and Africa as a peninsula separating that ocean from the Atlantic. These maps were made some twenty years before the editors of Ptolemy, by implication certainly, contradicted the geographical facts affirmed in their delineations.

It is an historic fact that for more than half a century before the Ptolemaic map appeared in printed form explorers sent out by the Portuguese prince, Henry the Navigator, had been disregarding the picture of Africa set forth by the ancient geographer. Stage by stage, they and their successors had been pushing their way down the West African coast, intent upon rounding its extremity and making their way to the Christian Abyssinian kingdom of Prester John. The logic of this persistent exploration pointed clearly to a belief in an open Indian Ocean on the part of Prince Henry and the later Portuguese rulers and mariners whom he had inspired.¹⁹

¹⁸ George H. T. Kimble, *The Laurentian world map with special reference to its portrayal of Africa*, in: *Imago Mundi*, I, pp. 29-33.

¹⁹ In *Genoese World Map 1457*, New York, 1912, p. 56n., Edward Luther Stevenson quotes the opinions of several writers on the underlying motive of Prince

The final and the most effective criticism of the fifteenth-century editors of the *Geography* is based upon their failure to embody in the Ptolemaic maps the greatly expanded knowledge of the world which through the narrative of Marco Polo's travels in the Far East had been current in Europe for nearly two hundred years before the period of their activities. We shall return later to that voyage homeward from China to Venice in which Polo, passing through the strait of Malacca, had seen the waters of the South China Sea merge with those of the Indian Ocean, and at that time we shall speak of certain maps of the period before 1477 in which through the influence of Polo's story the land barriers of the Indian Ocean at south and east had been removed and Ptolemy's eastern bounds of Asia extended to the Pacific shores and beyond.

The Ecclesiastical Maps of the Middle Ages

In so far as they represented the earth as a flat, circular disc, an oval, or a rectangle surrounded by a continuous ocean, the ecclesiastical maps of the Middle Ages carried on the ancient Greek concept of the world²⁰ and the most primitive mode of its cartographical representation known to us. "For my part," wrote Herodotus in the fifth century B.C., "I cannot but laugh when I see numbers of persons drawing maps of the world without having any reason to guide them; making, as they do, the ocean stream to run all round the earth, and the earth itself to be an exact circle, as if described by a pair of compasses, with Europe and Asia just of the same size."²¹ Despite his scorn of the ancient Greek delineation, however, Herodotus did not show his generation a better way of drawing its maps. He questioned whether Europe at the

Henry's African explorations, whether it was to find a waterway to India or to the eastern coast of Africa and the Abyssinian Christian empire.

²⁰ This concept, as will be made clear, was not the possession of the Greek world alone.

²¹ *Herodotus*, with an English Translation (Loeb Classical Library), New York, 1921, Vol. II, p. 235 (Book IV, par. 36).

north and east was bounded by the ocean, but he stopped short at the question, unable, it seems, to make an alternative suggestion.

The mode of representing the earth and its waters which the Greek historian contemned was so old even in his day as to have become part of the universal consciousness. No European map in this style proceeding from the pre-Christian world has come down to us, but its elements, with differences both of simplification and elaboration, are embodied in a representation of the world and its accompanying descriptive text found upon a Babylonian tablet of the fifth century B.C., a possession of the British Museum which seems to be the earliest delineation of the world to descend to our time.²²

The efforts of Marinus of Tyre and of Ptolemy at a scientific representation of the world failed completely to eradicate this ancient conception from the popular mind. While they and their copyists were drawing their learned maps, projecting to the best of their skill a spherical world upon a plane and applying to the surface thus created measurements of latitude and longitude, tropics, zones, and the Equator, anonymous draughtsmen still were carrying on the ancient tradition of cartographical representation, amusing and instructing the ordinary man with a simple and lively picture of the world he lived in. It is probable that, along with so much else of worth, the Ptolemaic system was lost to the world in the centuries following the barbarian invasions of Europe. But though the twilight and the intellectual disintegration might obscure for a time the learned Ptolemaic atlas, the primitive world map persisted in men's memories, so that when the churchmen of the Dark Ages sought to display the picture of God's creation to their people they found at hand a living tradition of cartographical representation. It was for them as if Ptol-

²² Eckhard Unger, *From the Cosmos Picture to the World Map*, in: *Imago Mundi* II, pp. 1-7, suggests a relationship between the geographical conventions of this Babylonian map and the stylized ornamentation of a Germanic gold disc of the middle of the second millenium B.C. and of a fresco of about 2000 B.C. found on the shore of the Dead Sea.

emy had never existed.²³ It is probable, furthermore, that they would have rejected Ptolemy even if they had known him, for his maps were built upon the theory that the earth was a sphere, and that was a theory which demanded for the equilibrium of the sphere antipodal land masses in the south and west as counterweights to Europe and Asia of the north and east. This meant the existence of inaccessible lands and peoples unknown to the Scriptures. Such a condition formed an effective denial of the Master's word that the Gospel would be preached throughout all the world and a negation of the doctrine that all men were the fruit of a single creation, fallen through Adam and in Christ made alive.²⁴

These maps of the ancient world and the mediaeval monks have been called "wheel maps" because they were round and because the likeness was further accentuated by their possession of features roughly resembling spokes. Running vertically from north to south the river Tanais, the Don of our time, separated Europe from Asia, while across the Mediterranean in southward prolongation of the line of the Tanais ran the Nile, separating Asia from Africa. Meeting this line at right angles, separating Africa from Europe, ran horizontally the long and narrow Mediterranean Sea. At first glance these maps seem unworthy of consideration, productions based upon a scheme fantastically incorrect in content, mode, and form. Lelewel writes of them in these words: "Qualifiées de mappemonde, de cartes géographiques, elles ne sont que d'images dessinées ou peintes, de la terre qu'une imagination pieuse s'était créée sur les traditions grecques et bibliques . . . Toutes sont le produit de la même conception; toutes dérivent du même modèle."²⁵

It seems to be true that the ancient Greek maps were not invari-

²³ Lelewel, I, pp. 84-91, section *Images du Monde*, describes these "roues à trois rayons," and discusses some of the points here brought out upon the basis of a number of the maps which have survived.

²⁴ Rainaud, p. 130, especially note 2. See our Section VI, *The False Continent, Terra Australis*.

²⁵ Lelewel, I, p. 84.

ably circular but that sometimes the earth might be shown upon them as an oval or as a rectangle. It is certain that the earliest known of the ecclesiastical maps is not of the circular shape but of the rectangular. In his *Christian Topography* of about 535 A.D. the monk Cosmas attacked what was to him the pseudo-scientific notion of a spherical earth. Upon his own definite ideas of an earth in the shape of the Tabernacle which the "blessed Moses" made in the wilderness and declared to be "a pattern of this the visible world," he constructed the map which goes by his name. In that delineation the rectangular earth is surrounded by the continuous ocean, but bounding the ocean at north, south, east, and west are long, narrow parallelograms which make a frame for the picture at the same time that they represent solid lands. According to Cosmas these were the lands where man had dwelt before the Flood, since then uninhabited and inaccessible. Other mystical elements are found in the map of Cosmas which seem to relate it more directly in some senses to the Babylonian production of a thousand years earlier than to the normal map of the ancient Greek geographers.²⁶ Few of the ecclesiastical maps are so deeply tinged with symbolism and typological references as this one. The map of Beatus of Liébana to which we shall refer in our section *The False Continent* is a straightforward picture of the world so far as it could be presented by its maker. (Plate II.) Many others are that in purpose and execution.

Because the ecclesiastical maps, as Lelewel remarks in the passage quoted above, trace to the same model, those of one century are much like those of another in form and content. Their successive repetitions of the same design all but precluded development; they played small part in the evolution of cartography. But despite its obvious defects, this wheel map of the ancient and

²⁶ *The Christian Topography of Cosmas, an Egyptian Monk*, translated and edited with an introduction by J. W. McCrindle (Hakluyt Society, No. XCVIII), London, 1897. For the analogy between the figure of the earth and the Tabernacle, see pp. 42-44.

mediaeval world, this picture of the earth and its encompassing waters, is not to be cast aside as utterly lacking in virtue. The more familiar one becomes with it, the less he is inclined to dismiss it as merely quaint. Behind its construction was an idea and a tradition. In this study our interest in the specimens which have survived lies in the fact of their retention of the ancient Greek theory of a continuous, earth-surrounding ocean stream. In them the Indian Ocean, a narrow sea, mingles its waters with the ocean stream, keeping alive in this particular a truth perverted by the learned geographers of Alexandria.

It is, moreover, not entirely fair to the ecclesiastical map to suggest, as we have done, that it underwent little development and had little influence upon geographic ideas. Not only did it keep the Indian Ocean open at its eastern extremity but it continued throughout its history to show Africa washed by the western ocean stream and the Indian Ocean. This was an Africa twisted uncomfortably to the eastward in order that it might be fitted into the circular form of the map, but a peninsula none the less and by that much a true representation of the facts. In the early maps generally and in some of the fifteenth century—in that of Andrea Bianco of 1436 (No. 9), for example—Africa is twisted so far to the east that its Indian Ocean coast runs straight across the map, straight east and west, rather than roughly north and south. In such delineations the Indian Ocean is a long, narrow body of water entering the eastern ocean stream by a strait-like passage of its own width. As early as 1320 we see some modification of this notion in the circular map of Petrus Vesconte (No. 5) in which the Indian Ocean coast of Africa runs in a southeasterly direction and the axis of the Ocean itself runs southeast and northwest. A virtually identical delineation is found in the Marino Sanudo map (No. 6) of about the same period. In the Fra Mauro map of 1459, in which the circular type of construction reached its highest point, it is as if a giant hand had taken hold of the tip of the African continent and pulled it back westward until its

Indian Ocean coast had approached the vertical and that ocean itself become a broad sea, wide open to the southward.²⁷

There are other factors to be considered in the evaluation of the circular world picture of the Middle Ages. In the fifteenth century a number of maps of this category began to enlarge their content by crowding into their already confused areas information which Marco Polo had brought back from his eastern travels. The celebrated map in the Stefano Borgia Museum (No. 10) engraved upon a plate of copper in the middle of the century and the Andrea Bianco map of 1436 are members of this group, but still more notable is the Fra Mauro map in which the Polean data are set forth even to the inclusion of the island of Zimpagu, probably the earliest delineation of Japan upon a European map known to us today.

Credit is given these fifteenth-century makers of the circular maps for grafting the Marco Polo geography upon their ancient form, but little is allowed them for their delineation of an open Indian Ocean and a peninsular Africa. This small measure of success in delineation, say those who hold the picture map in scorn, was attained by guess and by chance rather than through the exercise of God-given powers of observation and reflection. But, however it came about, there it is—a fundamentally correct expression of popular belief maintained for something like two thousand years. We regard this map as an inferior production when we study it in comparison with the Ptolemaic maps and the portolan charts of the Middle Ages, but if we could go back to the Homeric age when it was the only form of world map existing, back, let us say, to the moment of its first construction, we would acclaim it as an effective organization of geographical data.

²⁷ Fra Mauro made this world map for Alfonso V, King of Portugal. Lelewel suggests (Vol. II, p. 94) that his peninsular Africa and open sea to India were put into the map to flatter the ambitions of the King and his valorous explorers, saying somewhat cynically, "Ne pas suivre l'opinion du roi était peu courtois." Fra Mauro, however, was but expressing a growing belief of his generation. His Africa and open sea route to India are not more radical than those of the maker of the Genoese world map of 1457 (see Note 19, above). Thirty years later Bartholomeu Dias rounded the Cape of Good Hope.

When Hans Rüst published his woodcut map of the world at Augsburg about 1480 (No. 14), the day of the ecclesiastical type of representation was about over so far as the literate western European was concerned. It became less and less important in the history of mapmaking after the Discoveries began, but that does not mean its complete disappearance from record. Clearly there was something about these circular maps that met a need, for the form in which they were cast possessed an astonishing vitality. Virtually disappearing from western Europe after the exploits of Dias, Columbus, and Vasco da Gama, they survived, or were revived, in Russia, where they are found, printed from copperplates, at various times in the eighteenth century, and even in the early nineteenth, as part of the stock in trade of the hawker of books and prints.²⁸

The Portolan Chart

Throughout the Middle Ages men as ever were sailing the seas and making charts of the coasts they visited and the waters they traversed. Along with the graphic portrayal of the features they wished to remember for future guidance went the compiling of written memoranda of distances, directions, ranging points, winds, rocks, shoals, harbors, fresh water for drinking, and all the local knowledge which might stand between them and disaster when next they came that way. These vital items formed the sailing directions for that coast. Primarily the charts were drawn and the directions compiled by an individual mariner for the short stretch of coast to which his business led him, but gradually through the centuries, as commerce expanded and voyages became longer, a considerable number of these charts would be brought together, and when their matter had been coördinated

²⁸ Avrahm Yarmolinsky, *Russian Americana*, The New York Public Library, 1943. The Russian wheel map of the eighteenth century which Dr. Yarmolinsky reproduces in part shows development in several particulars beyond the contents of the mediaeval prototypes. In the ocean stream off the coast of Spain lie four islands representing various parts of America while in the Far East are shown Kamchatka and Japan.

and checked with the written data of the sailing directions there would emerge a chart for a relatively large area of sea and shore. In like manner the sailing directions of many pilots would be amalgamated to form the guide for an extensive navigation. This written guide was the periplus of the ancient world, the portolano of mediaeval Europe, and the "coast pilot" of our day and country. There can be little doubt that this portolan, as it is called in English, was intended to be used with a chart or group of charts. For that reason the type of chart created through the fusion of many small coastal sketches is properly described as a portolan chart. The late Middle Ages saw the creation by natural accretion of portolan charts of such scope as to take in the seas and shores of the known world. For small areas or large, for the Mediterranean or the Seven Seas, the portolan chart, built upon experience rather than theory, was the most important, the most significant cartographical document of its time.²⁹

The aim of the portolan chart was to show the shape of a coast, the distances from place to place, and their orientation with respect to one another. Because these features were laid down upon a plane surface without regard to the sphericity of the earth, there was inherent in their nature a distortion in all relationships. That distortion increased with the increase in extent of the area delineated. Because of this defect in projection, or, rather, of the lack of any system of projection, the world maps of the portolano type were of a restricted usefulness as sailing charts, but they presented both to the mariner and to the landsman a comprehensive and com-

²⁹ The standard work on the portolan chart is A. E. Nordenskiöld, *Periplus, An Essay on the early History of Charts and Sailing-Directions*, Stockholm, 1897, a book of great importance. A notable service was rendered the student of cartography by the studies of the portolan chart undertaken and published by the late Edward Luther Stevenson and by his publication of magnificent full-size facsimiles of many extant specimens of the genre. Some of the most important of these studies and reproductions were made under the auspices of The Hispanic Society of America. See *The Hispanic Society of America Catalogue of Publications*, by Clara Louisa Penney, New York, 1943. Others were of Dr. Stevenson's own publication in the series of twelve parts entitled *Maps illustrating early Discovery and Exploration in America*, 1502-1530, New Brunswick, New Jersey, 1903.

prehensible picture of the shape of the continents and the breadth of the oceans of the world. Furthermore, as they were made up of many small charts brought into being through the actual observations of mariners, and as they were continuously being enlarged and their details refined by data currently acquired from the logs and charts of traders and explorers, they became the chief and most reliable source for the expansion in content of the cartographic record.

The Catalan Atlas (No. 8) of the fourteenth century, the world map of Henricus Martellus Germanus (No. 18) of the fifteenth, the great sixteenth-century charts of Juan de la Cosa (No. 19), Canerio (No. 20), Cantino (No. 21), and Diego Ribero (No. 40), the sixteenth-century Maggiolo and Agnese atlases, and others in this category mentioned with important implications in various sections of this paper are of the general type described as the portolan chart. All these were brought into being through the consolidation of many small charts, recording the actual experiences of innumerable individual mariners, experiences extending back for generations, maybe centuries, before their amalgamation into a larger unit.

It has been said previously that upon the data collected by the makers of the large and small portolan charts was based the reformation and later evolution of the Ptolemaic atlas. It is true also that the portolan chart became the mariner's chart of our time when it had learned the rules and determined to abide by them, when, in brief, it adopted the degree net of the Ptolemaic system and submitted itself to the mode of projection devised in 1569 by Gerhard Mercator.³⁰ These maps fed the continuously growing data collected by merchants and explorers into the drafting rooms of the cartographers where were constructed the formal printed maps from which the world learned its geography. The

³⁰ Stevenson, *Canerio*, suggests that the notable chart of about 1502, familiarly called the Canerio chart, was "perhaps the oldest known marine chart on which degrees of latitude are indicated."

importance of this portolan chart, the manuscript chart of the practical mariner, cannot be overestimated, therefore, as an element in the development of cartographic knowledge. After Marco Polo's voyage homeward from China in 1292-1295 the portolan charts, first constructed for the Mediterranean area alone, began to assume a position of importance in the mapping of the coast lines of the Indian and Pacific Oceans.

Martin Behaim and Henricus Martellus Germanus

At the end of the thirteenth century, the mapping of the world showed little advance, so far as the record has come down to us, beyond what had been portrayed in the world map and the twenty-six sectional maps of Claudius Ptolemy constructed in the second century A.D. But thanks to the gradual accretion of data and to the epochal narrative of one great and observing traveller, there was to be a tremendous advance in geographical knowledge and the cartographical representation of it in the fourteenth and fifteenth centuries. In the year 1298, Marco Polo, a Venetian trader, beguiled his weary hours as a prisoner of war in Genoa by dictating to a friend the story of a twenty-years' residence in China at the court of Kubla Khan, recounting the overland journey thither of himself, his father, and his uncle, their travels hither and yon in that great empire and their return voyage to Europe by way of the China Sea, the Indian Ocean, and the Persian Gulf. Polo's narrative, quickly disseminated in numerous manuscript copies,³¹ broadened the conception of the world held by the men of his day and established a new geography of the Far East. Many of the learned men of his and the ensuing two centuries, however, refused to accept the cartographical additions to which his narrative gave form as anything except conjecture based upon an interesting but unverified traveller's tale. Among these, as we have seen,

³¹ An account of the Marco Polo manuscripts is found in *The most noble and famous Travels of Marco Polo*, edited by N. M. Penzer, London, The Argonaut Press, 1929.

were those very conservative men, the editors of the fifteenth-century editions of Ptolemy, who continued to show upon their maps the concept of eastern Asia which the ancient geographer himself had held some thirteen hundred years earlier. Not all scholars, fortunately, were so deeply steeped as these in conservatism. The Polean geography must have found its way into many maps of the period between the return of the Venetian traders in 1295 and the publication in 1492 of the globe of Martin Behaim. Certainly it is true that at least four of the most important world maps remaining from that period—the Catalan Atlas of 1375, the Genoese World Map of 1457, the Fra Mauro planisphere of 1459 and the planisphere of the Stefano Borgia Museum of about 1452—are rich in the geographical data and the terminology of the Polo narrative.³²

The globe of Martin Behaim of 1492 (No. 17) provided for the time of its construction a summary of contemporary knowledge of the world, a graphic setting forth of proven fact and assumption.³³ It embodied, with some confusion, the record of many Portuguese explorations of the west coast of Africa, though it fell short of a perfect statement in this particular by failing to mention the all-important voyage, concluded in 1488, in which Bartholomeu Dias rounded the Cape of Good Hope. It accepted without question the additions to the geography of the Far East derived from the narrative of Marco Polo, removing the land barriers to the south and east of the Indian Ocean and placing Madagascar, on the strength of Polo's reference to it, in the open sea off the southeastern extremity of Africa. Though it carried on the error of Ptolemy with regard to the southerly extension of Indo-China, it extended eastern Asia far beyond the Ptolemaic boundary, showing graphically the Marco Polo concept of the coast of China, the island of Japan, and the large islands and

³² Nordenskiöld, *Periplus*, pp. 140-141.

³³ E. G. Ravenstein, *Martin Behaim, his Life and his Globe*, London, 1908, is a critical examination of the Behaim claims and a review of existing knowledge on the subject of his voyages and his mapmaking.

clusters of small islands which make up the Malayan Archipelago. It demonstrated that from the Arctic to the Isthmus of Suez, Asia was surrounded by water, and, though very free and easy and unconfined in the handling of its configuration, it showed Africa as a peninsula thrust between the Atlantic and Indian Oceans. In the Behaim globe we thus find portrayed the growth in geographical knowledge which, even before the discovery of America, had taken place as the result of the pre-Dias African voyages of the Portuguese and the far-eastern travels of Marco Polo. It gives us a comprehensible picture of Africa and the Far East, and displays with the utmost clarity the position and relationship one to another of the Atlantic, Arctic, and Indian Oceans. Off the eastern coast of Asia it places the "oceanus Indie superioria," that body of water we recognize as the Pacific, though in Behaim's ignorance of a continent lying between Europe and Asia, this great sea formed a continuous body of water with the ocean which washed the western shores of Africa and Spain.

Through the circumstances of his homeward voyage, Polo's account of the positions relative to one another of the islands off the Asiatic coast was extremely vague. It was inevitable, therefore, that those islands and the coast itself should be located almost arbitrarily by Behaim and his successors of the period before 1511, when the Portuguese captured Malacca and began to acquire familiarity with its neighboring islands and waters. But for all its many faults, the Behaim globe presents a display of fact and supposition of high importance. It is difficult to think of a geographical document of the past with a greater interest for us today than this globe produced by the Nuremberg geographer, this picture of the world at the close of the pre-Columbian era, standing at one end of a term of centuries with Ptolemy's world map at the other. The static Middle Ages were about to end, and the period of discovery was about to begin. Behaim's world picture was soon to be greatly changed. His representation of lands and waters and his estimate of the distance between Spain and

the land of Kubla Khan was much the same as the concept of Columbus in the years in which the great plan of a western voyage was forming in his mind. Behaim put into his map the knowledge current in Lisbon when he and Columbus were there in the 1480's. It may be, as the historian Herrera declares, that they were known to each other and on occasion talked over these matters of mutual interest, though there is no documentary evidence of such a relationship.³⁴ A glance at the Behaim globe enables one to realize how simple after all was the Columbian project—a short journey of 3,080 nautical miles from the Canaries to Marco Polo's island of Japan. Columbus's figuring was even more optimistic. According to his mathematics, Japan lay only 2,400 nautical miles from the Canaries.³⁵

Emphasis has been placed here upon the Behaim Globe because, as said before, it is a spectacular display of fact, hearsay, and tradition, but there exists a less well-known map of the period which has the same or, in the minds of some, greater importance as representing the state of geographic knowledge just before the voyage of Columbus. The world map of Henricus Martellus Germanus is amazingly like the Behaim Globe in its geographical configurations. Like Behaim he unties Africa from Asia and opens the Indian Ocean some six years before the voyage of Vasco da Gama. Going further than Behaim, he records in explicit legends the rounding of the Cape of Good Hope by Bartholomeu Dias in the voyage of 1487. His Indian Ocean connects with an unnamed sea which washes the east coast of Asia. He fails, however, to locate or name Japan among the islands lying off this coast, and in other particulars his information is less full than that of the Behaim Globe in the portrayal of this area. Difference of opinion exists as to the date of this significant map. Nordenskiöld suggests

³⁴ Idem, pp. 32-34. The reference to Herrera there made is to the *Historia General de las Indias*, Dec. I, lib. 6, I, c.2.

³⁵ Samuel Eliot Morison, *Admiral of the Ocean Sea*, 2 vols., Boston, 1942, I, pp. 87-91, makes a clear interpretation of the ideas of Columbus with regard to the distance between the Canaries and Japan.

for it the year 1492,³⁶ while Ravenstein, biographer of Behaim and devil's advocate of his reputation, dates it 1489 and suggests it as one of the sources of the great globe.³⁷

Recapitulation

From this discussion of the mapping of the world before the period of discovery one learns that the concept of a land-enclosed Indian Ocean accepted by Ptolemy and passed on by him in the text and maps of his *Geography* was little more than an inherited scientific hypothesis, of interest chiefly to the learned men of his day. Before Ptolemy's time popular knowledge and conjecture pointed to an open Indian Ocean and a peninsular Africa, and there is reason to believe that this conception of world geography was a commonplace in the minds of the sailors and merchants of Europe when the great book was put into print with maps in 1477. Though little more than conventionalized pictures of the earth and its waters, the ecclesiastical maps of the Middle Ages retained the truth in respect to a junction between the Indian Ocean and a continuous ocean stream surrounding the land mass which made up the known world of Europe, Asia, and Africa. The most reliable maps of the period were the portolan charts, constructed upon the basis of the actual experiences of mariners. Upon certain of these, proceeding from the period before the revival of the Ptolemaic maps, was shown a clear understanding of the Indian Ocean, of the peninsular character of Africa, and of the Far East as seen by Marco Polo, an embodiment of the best knowledge of the day. The Martellus Germanus map of the world and the globe of Martin Behaim, the earliest terrestrial globe known to us, show before the discovery of America a picture of Africa, the Indian Ocean, and the Far East little different in its broadest features from the actuality with which we are familiar.

³⁶ Nordenskiöld, *Periplus*, p. 128..

³⁷ Ravenstein, pp. 64, 67, and elsewhere.

II. THE PERIOD OF THE GREAT DISCOVERIES

Contarini, Waldseemüller, and Ruysch

THE first notable factor in the broadening of the fifteenth-century European horizon was not the discovery of America in 1492, but the rounding of the Cape of Good Hope by Bartholomeu Dias in 1488. That achievement marked the culmination of nearly three quarters of a century of African coastal exploration, begun in 1415 under the Infante Henrique of Portugal, called in modern times Prince Henry the Navigator. The interest of this pious and scholarly prince in Portuguese expansion by way of the maritime road provided an impetus to discovery and settlement which animated his countrymen and their rulers for two hundred years. An event immensely more exciting than the voyage of Dias and one which provided a greater addition to current understanding of the world was the expedition of Vasco da Gama, who in 1497-1499 followed the track of Dias around the Cape, proceeded to Melinda, a point considerably beyond the farthest north reached on the east coast by his predecessor, made his departure thence, and sailed northeasterly across the Indian Ocean to India, the first voyage to that land by a water route from Europe. It has been easy to forget that to the European of the early sixteenth century this establishment of a new route to the East and a direct connection with it was a matter of as great moment as Columbus's discovery of a new world in the West. In 1500 the value of the western lands was still in question; no question could be raised as to the importance of India and the Far East, for already spices had come into Europe in the Portuguese vessels returning from the Vasco da Gama expedition. But whether this European at the turn of the century looked to the East, the West, or the South, he must have realized that life thereafter was never to be quite the same, for in little more than a decade the boundaries of his world

had been pushed back thousands of miles in all these directions, his sons and brothers and cousins were going forth to settle or exploit the new lands, and were sending back to him new foods, new fabrics, and a new conception of man and the universe.

This enlargement of the world he lived in was not to affect at once the thinking and the way of living of the ordinary man. Even the geographers were to require several years to assimilate the data obtained through the voyages of Dias, Columbus, and Vasco da Gama. Too much had happened in too short a measure of time. There was no portrayal of the new discoveries as a whole upon a printed map for nearly a decade after the return of Vasco da Gama from India. In the portolan charts of Juan de la Cosa and Canerio, the Cantino chart, and the anonymous King-Hamy chart (No. 22), now in The Henry E. Huntington Library, a good amount of the new information was recorded in the first two or three years of the century. But it must have been that these maps, made for private or official uses, were seen by relatively few people. Among those who saw them, fortunately, were certain cartographers who transformed the tentative delineations of the manuscripts into the irrevocable statement of prints made from woodblock or copperplate and intended for wide dissemination.

It was not until 1506 that a printed map displayed the new areas of the South, the East, and the West. In that year and in the two which followed were published three maps thought of today, so far as content is concerned, as the basis of modern cartography. The earliest of these was the Contarini-Roselli map dated 1506 and published in that year, probably in Florence (No. 23). Following this Italian production came in 1507 the huge map of the world designed by Martin Waldseemüller at the Gymnasium of St. Dié in the Vosges, and published by him either at that place or at Strasbourg (No. 24). In the next year was published, in Ptolemy's *Geography* of Rome, 1508, the world map of Joannes Ruysch (No. 25). In all three of these productions are laid down

with approximate correctness of reciprocal relationship the continents of Europe, Asia, Africa, and America, and the seas which surround them. In all three of them the empty ocean space seen upon the Behaim globe between Western Europe and Eastern Asia has been broken up by the island groups and the continental land of North and South America or both, while in the area of the Far East is represented the geography of Ptolemy and Marco Polo expanded by the more exact data then in process of acquisition by those Portuguese adventurers who were exploring, conquering, and setting up trading stations in the Indian Ocean area. Two of these maps—the Waldseemüller and the Contarini—have come but lately, relatively speaking, to the knowledge of scholars. The Waldseemüller map was discovered in 1901 by the Jesuit scholar, Father Joseph Fischer, in Wolfegg Castle in Württemberg, where it remained when last heard of; the Contarini map was unknown until its purchase by the British Museum in 1922. Before the features of these two productions had become familiar to modern scholars, the Ruysch map, the least correct in some particulars of the three, had stood alone in their minds as the chief agency through which the new geographical knowledge was disseminated among Europeans of the early sixteenth century. These maps outmoded not only the ancient Ptolemaic picture of the world, but as well the conception held by Columbus, Henricus Martellus Germanus, and Martin Behaim. They gave Africa its shape, removed the false southern boundary of the Indian Ocean, placed America, or a part of it, between Europe and Asia, and, by presumption, created that ocean, still unseen by European man, which today we call the Pacific.

There was something more than presumption and conjecture, however, in the maps of Contarini, Waldseemüller, and Ruysch. It seems clear that these cartographers had before them charts or narrative accounts of Portuguese activities in the Indian Ocean, and it was demonstrated by Father Fischer that Waldseemüller had seen the Canerio manuscript map of the world and had taken

much from it for the delineation of his American outlines.¹ He was influenced strongly also by Vespucci, whose narratives he published in his *Cosmographiae Introductio* of 1507, a work intended as a commentary upon this great map in twelve sheets which he issued in that same year, the *Universalis Cosmographia Secundum Ptholomaei Traditionem et Americi Vespucii aliorumque Lustrationes*. Upon this map appeared for the first time on any map the name "America," and in the Waldseemüller book of 1507 that name was first suggested as a proper designation of the new fourth part of the world.

For his picture of the coast of eastern and southern Asia, Waldseemüller superimposed the geography of Marco Polo and the Portuguese explorers upon the ancient Ptolemaic framework. East of the Malay Peninsula and extending in a broad curve far to the south of it, lies in the map of 1507 a second peninsula, the presence of which added confusion to many delineations of Asia of the ensuing fifty years. The explanation of that feature of the map—not Waldseemüller's invention by the way—demands our effort. It will be remembered that in the Ptolemaic world map there was placed eastward of the Aurea Chersonesus, known to us today as the Malay Peninsula, an uncouth southerly exaggeration of the land now called Indo-China, and that at about 15° south latitude this imaginary area joined the non-existent Terra Incognita which ran eastward from Africa and gave a southern boundary to the Indian Ocean. Now if a mapmaker had recently received information which laid forever to rest the question of the possibility of sailing round Africa and across the Indian Ocean to India, his first act would be to remove from his map the Terra Incognita with which Ptolemy had cut off the Indian Ocean at the south. This had been done, indeed, by Behaim and Martellus Germanus years before Vasco da Gama's voyage, and it had been

¹ Fischer & Wieser, pp. 26-28. It seems unquestionably true, however, that Waldseemüller had some other source than Canerio for his Asiatic section. For the line of connection between Canerio and Waldseemüller, see Stevenson, *Canerio*, pp. 81-82.

effected also by the celebrated cartographers of the period 1500-1502, including the maker of the Portuguese King-Hamy chart. But none of these men had yet learned that the Indo-Chinese extension on the Ptolemaic maps also was a figment of the imagination. They retained it in their maps, therefore, but deprived of the Terra Incognita to tie it to, and knowing that somewhere beyond it to the eastward must lie the great ocean, they had no choice but to portray this land area as a peninsula. Father Fischer has pointed out that the Behaim globe, and the Martellus Germanus and King-Hamy maps, or prototypes of them, were Waldseemüller's sources for his delineation of southern and eastern Asia. Still lacking exact information of what lay to the east of the Malay Peninsula, all three of these cartographers and the learned Waldseemüller, who accepted their concepts uncritically, fell back upon the authority of Ptolemy and allowed that extension of Indo-China to remain upon their maps, giving it an even more exaggerated reach to the south than had appeared in the delineation of the ancient geographer. As late as 1513, as we shall see (Plates VII and VIII), Waldseemüller offered conflicting evidence upon the existence of such a peninsula, and for nearly a century thereafter Apian and Honter and other copyists of the map of 1507 were repeating his error and consistently misinforming their many readers.

The Waldseemüller map of 1507 was the link between the old cartography and the new. Its features were repeated without acknowledgment of source in the productions of his contemporaries and successors, but the map itself disappeared from the cartographic record for nearly three hundred and fifty years. Before its rediscovery, it was known to modern scholars chiefly from the account of it in the *Cosmographiae Introductio*. Waldseemüller himself is authority for the statement that a thousand copies of it were printed.² With all allowance for the unkind treatment which time is known to accord large wall maps, it still remains something of a

² Fischer & Wieser, pp. 11 and 16.

mystery that besides the perfect example discovered in 1901 not a single sheet of the twelve thousand made for that edition is known to exist in any European library. We might, indeed, never have seen a copy of it but for the action of Johann Schöner, a globe maker, astronomer, and geographer whom we shall encounter later in another aspect of our study. At this first introduction to him he has just caused to be bound in a single noble volume the sheets of the Waldseemüller maps of 1507 and 1516, twenty-four in all; the sheets of the star map of Stabius-Heinfogel, drawn by Albrecht Dürer in 1515; and the gores of his own celestial globe of 1517. It was that volume which Father Fischer found in 1901 in Wolfegg Castle, the seat of the Prince Franz Von Waldburg-Wolfegg. For five years before that time, the actual content and shape of the map had been known to a few scholars from the greatly reduced copy of it made by Henricus Glareanus in 1510 (No. 27), but no one was prepared for the size and remarkable quality of the original when in 1903 the Jesuit historian published in facsimile his epochal discovery. Baron Nordenskiöld recorded as a last-minute addition to his *Periplus* of 1897 the implications to be drawn from the Glareanus copy of the Waldseemüller map discovered at Bonn a year or so earlier.³ If he had lived to see the great Waldseemüller production itself he would have recognized in it the map which tied together many loose ends in the history of cartography. His discussion of it would have added another rich item to the literature of a subject which invariably he treated with high distinction.

The influence of the map of 1507 is easily recognized in the cartographical publications of the ensuing half century. It was copied faithfully upon a greatly reduced scale by Peter Apian, the German cosmographer, and issued at Vienna in 1520 (No. 39) with Camers's edition of the *Polyhistor* of Solinus. This reproduction of the features of the large map was accomplished by Apian

³ Nordenskiöld, *Periplus*, pp. 152, 173, 178, 185, et passim. The specific reference to the Bonn maps is on page 178.

without mention of source or a word of acknowledgment to indicate that it was not of his own composition. For centuries it was believed to be Apian's notable contribution to cartography, and for those centuries it stood out as a landmark, distinguished in general for the richness of its geographical content and in particular for its first use on any printed map of the name "America." Both of these distinctions were taken from it by the discovery in 1901 of the Waldseemüller map of 1507. It had not indeed deserved the honor accorded it for the use of the word "America," for even with the Waldseemüller map lost to knowledge there were other known productions earlier than Apian's upon which that designation had been employed, for example, the Hauslab globe gores (No. 26) of the period 1507-1510;⁴ the Schöner Globe (No. 36) of 1515; and the so-called Green globe (No. 37) of about the same year.

The Apian map was given further currency when in 1530 Peter van de Waele, publisher of Antwerp, brought out a reëngraving of it for issue as a separate map.⁵ Other derivatives of the map of 1520 carried still further into time the influence of the great Waldseemüller production.⁶ Among these was the little world map with which Johannes Honter embellished his prose work, the *Rudimentorum Cosmographiae* of Cracow, 1530, and which he afterwards included in the collection of thirteen maps appended to his frequently reprinted poem, the *Rudimenta Cosmographica*, first published with maps at Kronstadt in 1542.⁷ Through the agency

⁴ Fischer & Wieser, pp. 14-15, accept the conclusion of L. Gallois that these Hauslab-Liechtenstein globe gores were by Waldseemüller and of the year 1507, relating them to the globe spoken of in the *Cosmographiae Introductio* of that year. Nordenskiöld, *Periplus*, p. 178, dates the gores 1510, and Stevenson, *Globes*, I, pp. 70-72, dates them 1509, with Waldseemüller's later *Globus Mundi* of 1509 in mind. Both Fischer & Wieser, p. 14, and Stevenson, *Globes*, facing p. 70, reproduce these gores.

⁵ F. G. Van Ortroy, *Bibliographie de l'Oeuvre de Pierre Apian*, Besançon, 1902, pp. 8-10.

⁶ Idem, pp. 7-8.

⁷ Bagrow, pp. 110-113; Avrahm Yarmolinsky, *Early Polish Americana*, The New York Public Library, 1937, pp. 34-36. A copy of the edition of Kronstadt, 1542,

of this popular treatise the Waldseemüller map with all its virtues and all its defects maintained a degree of currency until the year 1600, eighty-four years after some of its worst faults had been corrected by Waldseemüller himself in his map of 1516,⁸ and by many other cartographers of the intervening years.

In succeeding sections we shall be returning more than once to the three great maps here introduced and to a discussion of their special features. An important feature of the Waldseemüller map, its inset hemispheres, engages us in the immediately ensuing account of the hypothetical Pacific, that is, of the conceptions of the great ocean found upon the maps of the world in those early years of the sixteenth century before it had been seen by European man.

is in The John Carter Brown Library. Nordenskiöld, *Facsimile-Atlas*, records an edition of Tiguri, 1597; Bagrow, p. 113, mentions one of 1600 without specifying place of publication.

⁸ If we may assume, as we do upon good grounds in our next section, that Waldseemüller was responsible for the new map of India in the Ptolemy of 1513, this year should be substituted for the date here set down.

III. THE HYPOTHETICAL PACIFIC

The Waldseemüller-Stobnicza Hemispheres

THE record of the great discoveries portrayed in the three maps of 1506, 1507, and 1508, discussed in the foregoing section was to be expanded with fuller comprehension and a more thorough assimilation of the new data in several notable maps, both manuscript and printed, of the ensuing decade. The earliest of these more enlightened productions, curiously enough, had first been published as one of the two hemisphere insets found at the top center of the Waldseemüller map of 1507. The eastern hemisphere in this earliest division of the world into two separate hemispheres displayed the boundaries of the Far East virtually as represented by Ptolemy, though in its open Indian Ocean and its delineation of Africa, Madagascar, and Zanzibar, it announced the new era in geographical knowledge. Fittingly this map is flanked by a portrait of the Alexandrian geographer. The map of the western hemisphere, flanked by a portrait of Americus Vesputius, showed a new theory of the American discoveries and the eastern seaboard of Asia with a delineation of the Marco Polo concept of its coast and off-shore islands. This notable map of America and eastern Asia is usually and quite properly placed in the category of imaginary cartography. Its author could not have known from existing data that North and South America formed a continuous land mass joined by an isthmus and separated from Asia by an ocean in which lay Marco Polo's island of Japan. This term "imaginary cartography" is sometimes applied to Waldseemüller's little map of the western world with a suggestion of reproach, but nothing could be more unjust, more indicative of an imperfect comprehension of what had been accomplished in that portrayal. In the making of this map Waldseemüller had employed the process of scholarly conjecture in the most distinguished fashion. In setting forth in two hemispheres a new con-

cept of the world as affected by the recent discoveries, in presenting a North and South America joined by an isthmus as an alternative to his portrayal of them in the large map beneath as two separate continents, he engaged in a notable exercise of the constructive imagination, endowing contemporary scholarship with a scientific hypothesis of the largest importance. If this was a guess, it was an inspired one, for here roughly is portrayed for the first time the world as we know it; here six years before Balboa's discovery is the broad Pacific hypothetically constructed. What a world it would be if even a small proportion of our guesses could be so completely borne out by the facts as afterwards discovered!

The influence of the Waldseemüller hypothesis is perceptible in the work of other geographers of his time. It may be that it was most widely disseminated among scholars and readers generally through the plagiarism of the two inset maps by the Polish scholar, Joannes de Stobnicza (No. 33), who in 1512 published them in Cracow to illustrate his treatise, the *Introductio in Ptholomei Cosmographiam*. Printed back to back upon a single sheet and folded within an easily portable small quarto volume, it is probable that in the Stobnicza reproduction the maps had a broader influence than in their original form as insets upon the great wall map of 1507. To distinguish the maps in this form from the insets upon the large map, we shall speak of them as the Waldseemüller-Stobnicza hemispheres. (Plate IV.)

It was not alone through the Stobnicza western hemisphere map, however, that Waldseemüller's picture of the hypothetical Pacific was carried to the men of the period. Later we shall see that this concept was studied and given some measure of contemporary circulation in manuscript copies and derivatives made by Henricus Glareanus, a contemporary Swiss geographer.

The Maggiolo World Map of 1511

Among the manuscript maps which followed very soon after those productions of 1506-1508 in which were summarized the

results of the great voyages of Dias, Columbus, and Vasco da Gama was the beautifully drawn world map in the portolan atlas of Vesconte Maggiolo of 1511 (No. 31). Constructed upon a circumpolar projection, and therefore not in the portolano canon, this delineation of the world draws upon the Contarini map or a common Portuguese prototype for its geographical data and upon Portuguese maps or narratives for its nomenclature. It records with the greatest fullness the place names which mark the Portuguese voyages along the African coasts and the western coast of India. It is, indeed, its picture of Africa which makes this map important in our present study. A comparison of the place names upon the west and east coasts of Africa shows that in this particular of nomenclature the map is more closely related to the Cantino than to the Canerio chart, but that neither Cantino nor any other map known to us is its direct prototype.¹ It is a composite of several Portuguese and Spanish sources, displaying a combination of elements differing from that presented by any of its known contemporaries or predecessors. It thus takes on the character of an original compilation carrying to Europeans the knowledge of Africa and of the west coast of India newly acquired by the Portuguese. In the same year in which the map was made Malacca was to be captured and a new period of Portuguese exploration and expansion was to begin.

The Maggiolo world map repeats the error of Contarini and Ruysch in placing the North American discoveries of Cortereal, to which it adds the "Terra de los ingres" of Cabot, on the northeastern extremity of the continent of Asia, an early delineation of a misconception which generally prevailed concerning the true nature of the western discoveries. The omission by Maggiolo of 170 degrees of longitude between the South American continent and the Asiatic makes it difficult to determine what

¹ This statement is based upon the writer's comparison of the African place names with the nomenclature of the Pilestrina, Cantino, Canerio, and Waldseemüller, 1516, maps found in the *Comparative Table of Names on the Coast of Africa* in Stevenson, *Canerio*, and with the *Synoptic Table* in Fischer & Wieser.

may have been his theory as to the intervening area, whether, indeed, he conceived of it as land or water. Its omissions in regard to Asia and its errors with regard to America, set forth several years after so much had been clarified through the several printed and manuscript maps of which we have been writing, indicate clearly that there was still confusion among the cartographers, still reluctance to accept what the bolder minds had suggested as the only possible arrangement of the lands and seas of the world, that is, the separation of the American continent from Asia by the great body of water soon to be known as the Mar del Sur or South Sea, and later as the Pacific Ocean.

The Ptolemy of 1513

The break between the old and the new geography was made complete with the publication of the edition of Ptolemy of 1513. In that production of Strasbourg we have a book which is believed to have been undertaken about 1505 by Waldseemüller and his associates at St. Dié but laid aside by them after much of the work, including the making of some of the new maps with which it is adorned, had been completed. This admirable project of a Ptolemy revised according to the new discoveries was revived by others than the St. Dié geographers and published in 1513. Notwithstanding the withdrawal of this group from the project, it is customary and, it seems from the evidence, permissible, to speak of the maps in the finished book which relate to the new discoveries as the work of Waldseemüller.²

The *Geography* of 1513 contained the most complete and most detailed graphic portrayal of the earth's surface which had yet appeared in print. In it there were found in addition to the twenty-seven maps of the ancient Ptolemaic canon, a group of twenty new maps of which five were based upon the discoveries of the

² A thorough discussion of this question of authorship is found in Henry Newton Stevens, *The First Delineation of the New World*, London, 1928, Chapter V. The Waldseemüller responsibility for the maps of the new discoveries is also accepted by Wilberforce Eames, in Sabin No. 66478, and by Fischer & Wieser, p. 25n.

Spaniards and the Portuguese in both hemispheres. A new map of India embodies the geography of southeastern Asia as laid down by Canerio. (Plate VIII.) A map of Africa in two sections delineates that continent with greater correctness, perhaps, than in any previous representation of it, recalling in the richness of its nomenclature the manuscript map of Canerio, 1502, and the general map and sectional maps of the southern continent in the Maggiolo Atlas of 1511. So rapidly had events moved, however, that the new map of the world found in the book, the *Orbis Typus Universalis*, 1513 (No. 35), was an anachronism at the time of publication, for in it Waldseemüller displayed much of the uncertainty and positive error which had characterized his large wall map of 1507. It had the merit, however, of being on the equidistant plane projection of the portolan charts and therefore easy of comprehension by those who sought from it merely a broad picture of the seas and lands of the world and their orientation with respect to one another. This was the first marine chart of the portolan type to be engraved and printed, and, indicative of the improvement to which maps of that category were being subjected, it was equipped with scales of latitude at the sides.

The outstanding anachronism of the *Orbis Typus Universalis* was the appearance upon it of the supernumerary peninsula to the east of the true Malay Peninsula, an error of the Waldseemüller map of 1507 for which we have offered an explanation in the foregoing chapter. (Plate VII.) This step backward by Waldseemüller to the concept of an earlier period of his geographical studies is all the more puzzling in that the more nearly correct position he had taken on this point was made clear in the new map of India (No. 34) found in the same volume. (Plate VIII.) In its triangularly shaped Indian peninsula, its abandonment of an extended Indo-Chinese peninsula east of the Malay Peninsula, and in particulars of nomenclature, one observes the influence upon its maker of the Portuguese discoveries as interpreted in the world map of Canerio.

On the whole the maps of the new discoveries in the 1513 Ptolemy carried to the general reader a sense of revelation. Despite details which may justly be criticized, we may think of the work which contains them as the vessel into which were poured the ancient Ptolemaic learning and the imperfectly assimilated knowledge of the new worlds of East and West which for some twenty years had been coming in from the practical navigators sent out by Spain and Portugal to explore their seas and chart their unknown coasts.

The Glareanus Hemispheres at Munich and Bonn

Despite the fact that the Pacific had been hypothetically set up in the Waldseemüller-Stobnicza hemispheres, and that in the Waldseemüller of 1507, the Contarini, and the Ruysch maps, the existence of an ocean between South America and Asia had been indicated, one learns of this ocean area from the new maps in the Ptolemy of 1513 only by implication or by measurement and calculation. The editors were making no guesses in a work intended for general circulation. It was a different case with other cartographers whose responsibility as educators of the public did not rest so heavily upon them. So it happens that in some measure the most progressive of the known maps of the period before the Pacific had been seen by Balboa, and before Magellan had tied it to the Atlantic and Indian Oceans, was that of the world divided into northern and southern hemispheres, first constructed about 1510 by the geographer, Henricus Glareanus, best remembered as one who in 1527 brought out a work of somewhat minor importance entitled *De Geographia*.³ But long before the publication of his book, this Heinrich Loriti of Glarus in Switzerland, generally referred to by his Latinized name, Henricus Glareanus, had been at work upon geographical problems. His work, like

³ Full title: *D. Henrici Glareani Poetae Laureati de Geographia Liber unus*, Basel, 1527. See Sabin's *Dictionary*, No. 27536. This work was published without maps despite its author's cartographical skill.

that of Waldseemüller, was forgotten almost as soon as it was accomplished, but again like that of his great contemporary it was destined to be recovered centuries later and given the honor it deserved. In the year 1892, there was described a sheet found in the university library at Munich which contained, on recto and verso respectively, two manuscript maps (No. 28) identified through their inscriptions as the work of Glareanus.⁴ In 1896, two manuscript maps drawn back to back on a single sheet, one a world map, the other the world in two hemispheres, were discovered in the university library at Bonn (No. 27). Both the Bonn maps contained the name of Glareanus and one of them the date 1510.⁵ We have spoken already of the relationship through plagiarism between the Waldseemüller world map of 1507 and the reduced copy of it made by Peter Apian in 1520, and between the Waldseemüller insets of 1507 and the Stobnicza hemispheres of 1512. These relationships, however, were not understood in 1892, and when it was reported that one of the Munich maps reproduced the Apian world map and the other the Stobnicza map of the Western Hemispheres, cartographical historians showed relatively little interest in their discovery. It was not until four years later that they learned from an inscription on one of the Bonn maps just then discovered that the Glareanus world maps preceded those of Apian and Stobnicza in time and that they were copied not from those plagiarisms but directly from the lost world map of Waldseemüller, described in the *Cosmographiae Introductio* of 1507. The Apian map immediately sank in the estimation of historians, for its previously conceded position as an original document could no longer be sustained. On the other hand, the Glareanus manuscripts, with what was believed to be their first use of

⁴ For title of Oberhummer's study of the Munich maps see our appended list of maps, No. 28.

⁵ In our appended list of maps, No. 27, reference is made to A. Elter, *De Henrico Glareano geographo*, who describes the Bonn world maps as bearing the date 1510. It seems that this date may properly be applied also to the hemispheres which the author describes as painted "in tabulae Bonnensis pagina aversa . . ."

the word "America" upon a map and their fullness of geographical data, immediately took on great importance. They were seen to be the link with the lost Waldseemüller production of 1507, and it was recognized that they possessed a sufficiency of cartographical data and nomenclature to make possible a reconstruction of the broad picture of the world as seen by the leading geographer of the age of discovery. Those features of the Glareanus maps became of little practical value when the 1507 Waldseemüller map was discovered in 1901, but of course the historical interest of the Glareanus maps remained unchanged.

It was not only, as already mentioned in passing, a reduced drawing of the Waldseemüller world map that was discovered at Bonn, but with it, on the verso of the sheet, a map containing the world divided into northern and southern hemispheres. Accompanying each of the hemispheres were the formula and diagrams upon which the projection had been made. Inasmuch as no earlier maps upon this projection have been located, it is believed that in this production is seen an individual contribution of Glareanus to the problems of map construction. The southern hemisphere in the Bonn sheet is drawn half the size of the northern, and evidence that the mode of projection had not been fully mastered by its inventor may be derived from the circumstance that the land masses of the southern hemisphere are drawn in reverse order to their actual position, east to west being laid down clockwise. Clearly this drawing of 1510 marked an experimental stage in the construction of hemispheres on an equidistant polar projection.

The Glareanus Hemispheres at Providence

There was nothing experimental, however, in a Glareanus map of the northern and southern hemispheres of a slightly later date which we must next examine. There is in The John Carter Brown Library an early draft, believed to be in the author's hand, of the *De Geographia* of Glareanus, containing, by way of illustration,

six maps, beautifully drawn and delicately colored. These maps comprise copies of the Waldseemüller world map of 1507, of each of the hemispheric insets upon that map, of the Ruysch map of 1508, and, Glareanus's original contribution, two circumpolar hemispheres (No. 29). There are only minor differences between the maps copied from Waldseemüller and Ruysch in the Providence manuscript and those at Munich and Bonn, but there are very important differences between the hemispheres in the Bonn sheet and those in the Providence book, for in the Providence drawings the two hemispheres are of equal size and the land masses in the southern hemisphere are projected correctly, east to west running counter-clockwise in the delineation. (Plates V and VI.)

It is clear that the Providence maps are of somewhat later date than those at Munich and Bonn. Just how much later seems difficult to determine. Various authorities have described them as before 1513, before 1516, or before 1520. Though of unusual beauty, fullness, and significance, the maps of this manuscript are less well known than those at Munich and Bonn, for until its purchase by the Library in 1912, it had been in private hands for nearly four centuries. So far as known, its maps were never described until the year 1905.⁶

Aside from its historic interest as preserving the Waldseemüller concepts, it is the perfected Glareanus hemispheres that give the chief significance to this manuscript. The relatively correct placing of the continents and islands in the southern hemisphere marks the occurrence, in the space of a quarter century or less after Bartholomeu Dias, of an extraordinary advance in geographical knowledge and cartographical method. Here in a single picture are to be seen the South Atlantic, the Indian Ocean, the South

⁶ E. Heawood, "Glareanus: his Geography and Maps" in *The Geographical Journal* for June, 1905. The manuscript was acquired by The John Carter Brown Library in 1912. See auction catalogue, Sotheby, Wilkinson & Hodge, lot No. 400, June 28, 1912. See *Annual Report*, The John Carter Brown Library, for 1912-1913, pp. 19-20.

Pacific, Southern Africa, a part of South America designated "Amerige," the false Indo-China peninsula, the tip of the Malay Peninsula, the tip of Taprobana, and the island of Madagascar. When one reflects that in 1488, twenty-two years before the first construction in 1510 of the Glareanus hemispheres, Europe had just learned of the rounding of the Cape of Good Hope, and that at that time America had not been discovered, nor India reached by the water route from Europe, nor Madagascar seen and correctly located, this representation of all these lands and their encompassing oceans in broadly correct relationship of position, bespeaks a startling growth in man's knowledge of the world he lived in. Born in 1488, the year of the Dias achievement, the young Swiss scientist had grown to manhood along with this new world of the south, east, and west. He could understand and delineate it boldly while elder scholars must still make timid essays into reaches unknown to their youth.

In the Glareanus polar hemispheres, as in those in which Waldseemüller three years before had divided the world into eastern and western halves, we recognize the constructive imagination at work, resulting, in this as in the earlier instance, in the creation of an hypothetical Pacific. In his northern hemisphere, Glareanus has employed the American configuration of Waldseemüller and has separated the new continent from Asia by a sea in the middle of which lies Japan. In the southern hemisphere that sea lying to the westward between South America and the Malay Peninsula suddenly broadens and joins itself at east and west to the Atlantic and Indian Oceans. Stretching to the poles at north and south, bounded on the west by Asia, on the east by America, we have in these notable little maps the broad Pacific virtually as we know it. When one recalls the guessing, the groping, and the fumbling which characterize so many printed maps of the sixteenth century, one wonders why this truly distinguished production in the form in which it is found in the Providence codex failed to find its way into print for the illumination of the contemporary world.

The *De Geographia* of Glareanus is reputed an indifferent performance chiefly because its applications had been outmoded by the time the book was published in 1527. If the manuscript of 1510-1520 now at Providence had been published with the maps we have described at any time before Magellan's voyage, the world of that period would have been the richer by a notable work of geography.

IV. THE PACIFIC BECOMES A REALITY

Balboa upon a Peak in Darien

HARDLY had the first Spanish settlement on the Isthmus of Panama been effected when a rumor became persistent among the colonists regarding the existence of a great ocean lying to the southward of their town of Darien. That rumor had its origin in the stories of the natives with whom they communicated rather than in the maps and theories of European scholars. There is no evidence, certainly, that Vasco Núñez de Balboa had ever seen the maps of Waldseemüller, Stobnicza, or Glareanus when in 1513 he set out from Darien upon an expedition of conquest and discovery, but it seems clear enough that he had heard and fully accepted the native stories, true for once, of rich kingdoms to the south of him, bordering upon a limitless sea. Though neither he nor anyone of his time could know it, destiny had placed him at the one spot in all the western world as then known from which the discovery of that sea might most easily be made.

The arduous character of Balboa's campaign has been lost sight of in the glamor of the incident which concluded it. One day in September, 1513, he climbed that celebrated peak in Darien "from the whiche," says Peter Martyr in Richard Eden's mouth-filling English, "he myght see the other sea soo longe looked for, and never seene before of any man commynge owte of owre worlde."¹ Because at this point the isthmus runs east and west, Balboa found himself looking southward at his newly discovered ocean. Naturally enough the name of the waters he saw became the Mar del Sur, and the South Sea, spoken and written in various tongues, was the designation long applied to the whole of an ocean which stretched to the Arctic as well as to the Antarctic world. It is incorrect, of course, to say that Balboa was the first

¹ Peter Martyr, *De orbe novo Decades*, Alcalá, 1516. Third Decade, Book I, fiii recto; Richard Eden, *The Decades of the newe worlde*, London, 1555, leaf 90 v.

European to see the Pacific, for long before his time Marco Polo had looked upon it from its western shores and had sailed the China Sea. The Portuguese, too, had recently made their way to the islands beyond the Malay Peninsula. But to Polo and the Portuguese mariners these were simply the offshore waters of Asia; to Balboa and those who heard the tale of his exploit the discovery of the Mar del Sur was the beginning of a new era of world expansion.

The Spice Islands

In his *De orbe novo* of 1516, Peter Martyr suggested, as seemed a natural thing to do, that in the great Mar del Sur discovered by Balboa lay those Spice Islands of the East, hitherto closed to Spanish enterprise, whence came the cloves and cinnamon and peppercorns which did so much to make the monotonous diet of Europe acceptable to the palate, or at least to the palates of those who could afford to buy them. There was nothing strikingly original in Peter Martyr's suggestion that the way to those distant places now lay open. It was probably the first reflection made by most thoughtful Spaniards when the news of Balboa's discovery reached them. The national rivalries of the period had their stimulative effect upon the Spanish policy of ensuing years. Since 1498 the Portuguese had been steadily making their way from India to the Spice Islands by way of the Indian Ocean. In 1511 they had possessed themselves of Malacca near the tip of the Malay Peninsula, and not many months afterwards had made direct contact with the Moluccas, those islands west by north of New Guinea from which cloves and other spices of several sorts were obtained. The city of Malacca was the emporium and distribution point of the spice trade and the strategic point of the Far East in the same way that nearby Singapore has become the strategic point of that area in our time. Its possession by the Portuguese and their establishment in the islands east of the Peninsula brought to them the wealth of the Indies and dominion over them. Into their hands fell the control of a trade which formerly had

been conducted laboriously through tedious transshipments and a succession of hungry middlemen and collectors of customs all the way from the far islands of the Indies to European warehouses by way of the Indian Ocean, the Red Sea, Egypt, and the Mediterranean. A detailed routing of the spices from the islands beyond Java to consumers in France and England forms the matter of one of the long legends on the Behaim Globe. Twelve transshipments are specified in that interesting outline of an important fifteenth-century commerce. Under the Portuguese domination the routing of the aromatic bales and bundles was changed; from Malacca to Lisbon by water was a long journey, but it required neither transshipments, tolls, nor commissions. It became for the Portuguese the pathway to empire.

The Waldseemüller Map of 1516

Nine years after the publication of his map of 1507, Waldseemüller constructed on a slightly smaller scale a *Carta Marina* (No. 38) in which the geographical features of eastern Asia show a considerable advance beyond the Polean geography upon which that section had been built in the earlier map. Father Fischer points to legends on this map which show that Waldseemüller had been reading a good many narratives in the intervening years, notably those found in that great collection of 1507, the *Paesi Nuovamente ritrovati* of Fracanzano da Montalboddo; the *Itinerario* of Lodovico Varthema, first published in 1510; and others specifically named. Upon the basis of these, both his history and geography had improved; he abandoned the name "America," apparently under the conviction that formerly he had given too much credit to Vespucci. He credited Columbus in this map with being the first to discover South America, Cabral the second, and Vespucci the third, and in many other particulars shows that he had not closed his mind to the reconsideration of facts and ideas after he brought out his book, map, and globe in 1507. Furthermore, having learned about Columbus, he went the limit, adopting the Dis-

coverer's own belief that he had reached the coast of Asia and designating the North American continent, "Terra de Cuba—Asie Partis." This was a step backwards, indicating the uncertainty that beset even the finest intelligences of an era in which the data were coming in too fast to be assimilated. The American error of the Waldseemüller map of 1516 is complicated by the fact that its maker shows no way in which that coast might be associated with Asia, and leaves unaccounted for 128° of longitude between the western edge of America and the eastern coast of Asia. That omission was taken straight from the Canerio map of 1502. The *Carta Marina* is an inferior production from the American standpoint, but it advanced so greatly common knowledge of the East that it must be thought of as one of the important maps in the historical cartography of that section of the world.

Father Fischer demonstrated that this mariner's chart of 1516 was based upon the great portolan chart which the Genoese Nicolo Canerio constructed in 1502, though with emendations by Waldseemüller, who was always very much more than a mere copyist. In the sea chart of 1516, southeastern Asia has advanced towards actuality an astonishing length beyond its portrayal in the map of 1507. India and the Malay Peninsula are shown virtually in the form of the Waldseemüller modern map of India in the Ptolemy of 1513. (Plate VIII.) The supernumerary eastward peninsula has disappeared; "Seylan" replaces in relative position the ancient Ptolemaic Taprobana; and lying near the Malay Peninsula are to be found in something like their correct locations, the islands of "Samotra" and "Giava seu Java." Eastward and northward of these are islands and coast lines recognizable by name at least if not always by contours. The great importance of this area to Europe is emphasized by a cartouche placed in close relation to it containing a list of the places from which spices were brought to the emporium at Calicut, the weights and measures employed, and the prices at which they were sold. The spice list were translated or adapted by Waldseemüller, with some re-

arrangement, from the 1507 edition of the *Paesi Nuovamente ritrovati*.²

It is easy to see that in some particulars this sea-chart of 1516 is a more important document in the development of Indian and Pacific Ocean cartography than the earlier Waldseemüller map of 1507. It does, indeed, mark a step forward. Events were moving rapidly. In the year of its publication Peter Martyr recorded for general European information the great discovery of Balboa. Three years later Magellan set out upon his voyage to the Spice Islands. Thanks to Waldseemüller's dissemination in his printed maps of 1513 and 1516 of the geographic ideas expressed in the Canerio chart and in the narratives of the *Paesi* and Varthema's *Itinerario*, the ultimate goal of the Magellan voyage was comprehensible to the Europeans of his decade. A crude copy of the map of 1516 with German legends (No. 42) was made by Laurent Fries for Grüninger of Strasbourg and published in 1530. There may have been earlier issues in 1525 and 1527.

The Voyage of Magellan

Determined not to be left out of the great opportunities that came from association with the East, Spain began looking westward to the Spice Islands as soon as Balboa made known his discovery of the sea in which they lay. Six years passed, however, before in 1519 she sent out the Portuguese malcontent, Ferdinand Magellan, to find his way around the south of South America and across the still unmeasured Pacific to the islands whence came the precious spices.

Magellan's voyage was one of the splendid achievements of man in his struggle against the forces of nature and the blows of circumstance. It was first conveyed to the contemporary European in a little book printed at Cologne in 1523 entitled *De Moluccis Insulis*.³ That narrative of the circumnavigation, cast in the form

² Book III, Chapter lxxxii.

³ Harrisse, *B.A.V.*, No. 122; Church Catalogue, No. 51; J.C.B. Catalogue (1875), No. 77; and J.C.B. Catalogue (1919), Vol. I, Part I, p. 88, where is also de-

of a letter from Maximilian of Transylvania, secretary to Charles V, to the Archbishop of Salzburg was too small a vessel for the mighty freight it bore. Here in strict compression was the epic story of the discovery and passage of the strait which bears Magellan's name, the voyage of the soldier-navigator across the unknown South Sea, his death in the Philippines, the visit of his broken fleet to the Moluccas, and the return to Spain in 1522 of the *Victoria*, the last remaining of the five ships which three years earlier had set forth upon the great adventure. When the *Victoria*—battered, leaking, but her hold packed with bales of spices—let go her anchor in the Bay of San Lucar, she had opened an east-west route from Europe to the Moluccas, discovered the Philippines, and, first of all ships, had made the circuit of the globe. When her slim crew of eighteen men had given thanks for their safe deliverance and had refreshed themselves with food and sleep, how the waterside taverns must have rung to their tales of three continents and three seas, tales of famine and thirst, of battle and death, of pain and sudden ease, of bleak Patagonia and the terrestrial Paradise of Ternate and Tidore! Like the far-travelled men taking their ease in Fultah Fisher's boarding-house,

They backed their toughest statements with
The Brimstone of the Lord,
And crackling oaths went to and fro
Across the fist-banged board.

The tales told by that hardy handful of sailor-men—boys, most of them, as the roster shows—are lost to us, but a relatively full account of the great voyage remains from the pen of one of those who went through all of it. This first-hand narrative of Antonio Pigafetta, strangely enough, seems to have been published first in French about 1525.⁴ What became of the edition for which

scribed the Rome edition of November, 1523, and references given to the second Rome edition of February, 1524.

⁴ *Le Voyage et Navigation Faict par les Espaignols es Isles de Mollucques*, Harri-
risse, *B.A.V.*, No. 134; *J.C.B. Catalogue* (1875), No. 86; *J.C.B. Catalogue* (1919),

Pigafetta received a twenty-year privilege in Venice in 1524, no one knows. Certainly it has not been recorded as having been published. Upon his return from the great voyage, Pigafetta presented his log of the voyage to Charles V of Spain. Travelling thereafter to Portugal, he made a verbal report to King John and then went to France where he told his story to Marie Louise of Savoy, the queen mother. From this pilgrimage to the courts, he finally made his way to Venice, his birthplace, where, in the diary of Marin Sanudo, we catch a glimpse of him in November, 1523, relating his adventure to the Doge and other willing listeners, rendering "speechless over the things of India" all who heard him. That was indeed a triumphant return to the home town.⁵

Magellan and the Schöner Globe of 1515

In all probability it will never be known to what extent Magellan was influenced by the Schöner globe of 1515 in the formation of his conviction that a passage would be found around South America into the Pacific. In the confused geography of that globe was shown a strait connecting the Atlantic and Pacific Oceans and dividing a continent designated "America" from a huge amorphous land mass to the south called "Brasilie Regio." This Brazilian region, centering upon the South Pole, occupied the position which soon was to be accorded in all the maps to the fabled Terra Australis, the unknown continent of which we shall have much to say in a later section.

If we accept the general belief that Magellan knew the Schöner globe with its delineation of this broad passageway from ocean to ocean at about 45° south latitude, it is profitable to go a step further seeking the origin of Schöner's idea that such a strait had existence. That idea, it is believed by many, had its origin in a

Vol. I, Part I, p. 95. A translation into English from the Italian manuscript in the Biblioteca Ambrosiana is found in James Alexander Robertson, *Magellan's Voyage around the World by Antonio Pigafetta*, Cleveland, 1906, 2 vols., where also is given a full and learned bibliographical discussion of the record.

⁵ Robertson, work cited in Note 4, Vol. II. 272, et seq.

little German news letter entitled *Copia der Newen Zeytung ausz Presillg Landt*. There has been uncertainty, however, as to whether this was actually the case. None of the three known editions of the relation is dated, and until recently there was a distinct lack of agreement as to the year of their publication. If HARRISSE was right in his attribution of it to the year 1520, its account of a Portuguese voyage to South America could not have influenced SCHÖNER in the construction of his globe of 1515. On the other hand, the date of "somewhere about 1506" given it by STEFAN ZWEIF makes it entirely possible that SCHÖNER could have known and been influenced by the book. But it seems unlikely that either of these extreme dates is correct. In his *Bibliotheca Brasiliense*, RODRIGUES dates the book 1514, accepting the attribution of it to that year made by CONRAD HAEBLER. The German bibliographer identified the voyage described in the *Copia* with a Portuguese expedition to America which returned safely to Europe and anchored at Lisbon in October, 1514.⁶ That date was determined from a manuscript version of the *Copia* narrative which HAEBLER found in the Fugger Archives at Augsburg. Everything that had to do with new lands and possible new markets or sources of supply was grist for the Fuggers. It was the strait described as a discovery of this expedition which SCHÖNER showed upon his globe of 1515, and it must certainly have been through the *Copia* or a manuscript version of it that the account of this voyage came to the globe maker, for in the little treatise he wrote to accompany his globe of 1515, the *Luculentissima quaedã terra totius descriptio*,⁷ the passage describing the strait is rendered from the *Copia* narrative itself. Ma-

⁶ For the bibliography and historical implications of this tract see: HARRISSE, *B.A.V.*, No. 99; J.C.B. Catalogue (1875), No. 62; J.C.B. Catalogue (1919), Vol. I, Part I, pp. 63-64; STEFAN ZWEIF, *Conqueror of the Seas: The Story of Magellan*, New York, 1938, pp. 76-78; J. C. RODRIGUES, *Bibliotheca Brasiliense*, Rio de Janeiro, 1907, No. 740; CONRAD HAEBLER, *Die 'Neuwe Zeitung aus Presilg-Land' im Fürstlich Fugger'schen Archiv*, in: *Zeitschrift der Gesellsch. f. Erdkunde zu Berlin*, Bd. XXX, 1895.

⁷ HARRISSE, *B.A.V.*, No. 80; Church Catalogue, No. 37; J.C.B. Catalogue (1875), No. 49; J.C.B. Catalogue (1919), Vol. I, Part I, p. 63. The book was printed at Nuremberg.

gellan could have learned of this supposed opening in the American land mass from the Schöner globe and book, or, having been in Lisbon in 1514, he may well have learned at first hand of the expedition of his fellow countrymen which it described. If it is true that Schöner and Magellan were influenced by the narrative of this voyage, we have before us another of those instances in which an *ignis fatuus* has led the way as successfully as if it had been the true pillar of fire. It seems certain that the strait which this news sheet described and which Schöner showed upon his globe and discussed in his little book and which Magellan may have set out to find was in reality the mouth of the Rio de la Plata, far north of the strait which the circumnavigator actually discovered. It seems, nevertheless, that the *Copia* and the Schöner globe and book belong to the story of that exploit so important in the history of the Pacific.

The Mapping of Magellan's Voyage

There remains even today some uncertainty as to the first recording of Magellan's feat upon the printed maps. In a work of Franciscus Monachus, *De Orbis Situ*,⁸ is found a world map in two hemispheres (No. 41) in which, if we forget the inexplicable delineation of "Brasilie Regio" on the Schöner globe, appears for the first time upon a printed map the mythical Terra Australis, occupying in this instance the whole space of the globe south of Africa and South America. Roughly indicated upon the Monachus western hemisphere map is a separation between South America and the southern continent intended to suggest the strait mentioned in the accompanying text as having been discovered by Magellan. (Plate IX.) The publication of this book has been dated as early as 1524, but recent investigation shows it to have been issued as late as 1529.⁹ The strait is shown again upon the

⁸ For description of the book, see HARRISSE, *B.A.V.*, No. 131; J.C.B. Catalogue (1919), Vol. I, Part I, p. 93.

⁹ W. Nijhoff, *L'Art Typographique dans les Pays-Bas . . . 1500 à 1540*, livraison xxx-xxxiii, pp. 20-22.

beautiful cordiform world map of Oronce Finé (No. 43), dated 1531 and known to most students from its presence in the Paris, 1532, edition of the *Novus Orbis* of Simon Grynaeus.¹⁰ It is probable that the first recognition of Magellan's feat in the nomenclature of a printed map is that which appears upon the Finé map where the Pacific waters beyond the Strait are designated "Mare magellanicum." On the so-called "Ramusio" map of 1534 (No. 44), designed to illustrate a compilation of narratives by Peter Martyr and Oviedo published in Venice in the year named,¹¹ the strait is clearly drawn and alongside it are the words "Stretto De magallanes," probably the earliest appearance of that designation upon a printed map. (Plate X.)

This "Ramusio" map of 1534, derived from the Ribero manuscript world map of 1529, is a production of extraordinary interest in the cartography of the Southern Pacific area. If for no other reason this statement would be true because of the pictorial suggestion offered by the cartographer that the ocean which twelve years before first had been crossed and which here is designated "Mar del Sur," was now become a relatively lively waterway. Here is portrayed a ship sailing westward from the Strait towards the Moluccas and northward from Peru to Panama, while another heads south from Panama to Peru. Pizarro's conquest of Peru had hardly been brought to an end when this map was published, but upon it are found this record of a western route to the Moluccas and the plain intimation of an established traffic between Panama and Peru. Upon it, too, are a representation of the lost city of Tumbez, and the designation of a section of South America as "Castiglia Nuova over Peru." This and other uses of the name "Peru" upon the Ramusio map are very early appearances upon a printed map of a word which was soon to be upon the tongue and in the thoughts of Europeans as the synonym for in-

¹⁰ Harrisse, *B.A.V.*, No. 172; J.C.B. Catalogue (1875), No. 102; J.C.B. Catalogue (1919), Vol. I, Part I, p. 104.

¹¹ Peter Martyr, G. F. de Oviedo y Valdés, and others, *Summario de la generale Historia de l'Indie Occidentali*, [Venice, 1534], Harrisse, *B.A.V.*, No. 190.

credible wealth. The relationship between this map and the American section of the Diego Ribero world map of 1529 is clearly that of derivative and prototype. It is unnecessary to say, perhaps, that the route to the Moluccas indicated upon the Ramusio map had not been a truly busy one since its discovery some fourteen years before. So far as recorded the only passage to those islands by way of the Strait of Magellan in that period had been accomplished by the fleet of Fray Loaysa, sent out in 1525 to possess the Moluccas for Spain and so gain for that country the fruits of her enterprise in sending forth the circumnavigator. Other voyages had been planned but for one reason or another had failed to reach the Strait.

The Line of Demarcation in the Pacific

No sooner had the Pacific been entered by Europeans than a political question arose to vex the diplomats and politicians of Spain and Portugal. To understand the situation it is necessary to step back in time to May 4, 1493, when, following the discovery of America, Pope Alexander VI issued the celebrated Bull *Inter caetera*, the second and effective form of the instrument universally referred to as the Bull of Demarcation.¹² Through the terms of this instrument Pope Alexander settled the rival claims of Spain and Portugal by dividing between them all the lands discovered or to be discovered, allocating to Spain everything west of a meridian running one hundred leagues west of the Cape Verde Islands, and, by implication, to Portugal all lands to be discovered east of that line of demarcation. In 1494, by the terms of

¹² Paul Gottschalk, *The Earliest Diplomatic Documents on America*, Berlin, 1927, gives text and English translation of the four bulls. He gives also a list of manuscript copies and printed editions with cognate material and reproduces three early maps showing the demarcation line. Printed copies of the Bull *Inter caetera* with the title beginning *Copia de la bula de la concession* are in The Library of Congress, The Henry E. Huntington Library, and The John Carter Brown Library. A copy of an edition with the title beginning *Copia de la bula del decreto* is in the possession of Dr. A. S. W. Rosenbach of Philadelphia. A copy of the Bull *Dudum siquidem* is in The Pierpont Morgan Library.

the Treaty of Tordesillas,¹³ the position of the line was moved farther westward and fixed at 370 leagues west of the Cape Verde Islands instead of the hundred leagues specified in the papal division. In the New World of the west, the papal decision and the later agreement just spoken of conferred upon Spain dominion over everything except Brazil, which became and remained Portuguese. It was relatively easy to determine the position of that meridian in the Atlantic, but where it ran in the unmeasured distances of the Pacific became a matter of continuous dispute between Spain and Portugal, raising the question of sovereignty over the Philippines and the spice-bearing Moluccas. Because of the complications it brought into the world, this Bull of Demarcation of May 4, 1493, is an item of first-rate interest in the history of the Pacific. The edition printed at Logroño about the year 1512 was, in all probability, the earliest appearance of the bull in print. It has been suggested on good grounds that it was printed at this time because of an expedition which Sebastian Cabot was about to lead westward under Spanish auspices. That may well have been the motive. Another likely reason for its publication in 1512 was the realization by the Spaniards that the Portuguese had taken Malacca the year before and would soon be on their way to the islands which lay in the waters beyond the Malay Peninsula. It behooved Spain to stake its claim to the lands in that part of the world which she believed had been allocated to her by Pope Alexander's pronouncement.

So far as the Moluccas were concerned Spain was late in asserting her sovereignty. Portugal reached them first in 1512 and set up a relationship with their rulers which gave her the advantage over her rival even though her status was not yet one of continuous occupation. At the Congress of Badajoz in 1524, Spain disputed the Portuguese claim by drawing the meridian of demarcation through the tip of the Malay Peninsula at or near Malacca, claiming for herself the Moluccas, the Philippines, the eastern

¹³ Idem, pp. 53-73.

Asiatic coast and everything else that lay east of it. Actually that meridian by modern calculation ran not west of the Moluccas, but something over five degrees east of them.¹⁴ On the map of Diego Ribero of 1529, the line of demarcation in the western world and its significance are shown clearly enough by its adoption as the prime meridian and by the placing of the Spanish and Portuguese standards respectively west and east of it at the foot of the map. In the east Ribero's meridian marking 180° brings the Moluccas within the bounds of the Spanish claim, but it does not include the Malay Peninsula and the eastern coast of China. Ribero recognizes the conflicting claims of Spain and Portugal in this part of the world by placing their respective standards at the foot of the map about ten degrees apart, leaving between them a considerable breadth of debatable area, comprising a large section of the Asiatic coast and many island groups of Malaysia. The Spanish claim is definitely marked in two maps, *Demarcacion y Navegaciones de Yndias* (No. 55) and *Descripcion de las Yndias del Poniente* (No. 56) which appear in the López de Velasco manuscript, *Demarcacion y Division de las Indias*, compiled about 1575.¹⁵ Upon these maps the meridian of demarcation is shown running through the tip of the Malay Peninsula. (Plates XII and XIII.) The assertion made of the Spanish claim in the López de Velasco maps was not without implications even in 1575, fifty years after that claim had been set up, for at this time the Philippines had been occupied by Spain for a decade only, and her right to those islands under the terms of the bull could still be questioned. So far as the Moluccas were concerned there existed when the López de Velasco book was written no real question of sovereignty. That dispute had long since been settled, and settled by the power of the purse rather than through diplomacy or the force of arms. When in 1529 the Emperor Charles V borrowed 350,000 ducats

¹⁴ Wagner, *Spanish Voyages*, pp. 95-98, clearly summarizes the dispute.

¹⁵ For a fuller account of the work in which these maps are found, see Section V. *The Pacific is Given Bounds*.

from the King of Portugal he put in pawn to his creditor Spain's claim to the Moluccas and all the islands for some three hundred leagues to the eastward of them. Spain afterwards held that the Philippines were not part of the security pledged at that time, and when she occupied those islands in 1565,¹⁶ Portugal let the action go by default. These conflicting claims were not entirely the results of greedy imperialism. In the state of nautical and astronomical science of that period, the difficulties attendant upon the correct establishment of longitude had not been solved. Longitudinal distances at sea still were measured by dead reckoning, and the length of a degree in miles had not yet been exactly determined. Until these fundamental factors in geodetic science had been established there could be no certainty as to the exact position of the eastern line of demarcation. By the time that was accomplished a *status quo* had come into being which rendered the question purely academic.

¹⁶ Wagner, *Spanish Voyages*, Chapter V, discusses the Spanish attainment of sovereignty in the Philippines.

V. THE PACIFIC IS GIVEN BOUNDS

The Ribero Chart of 1529

IN 1529 there was constructed by the pilot Diego Ribero a large manuscript world map of the portolano type which marked an important advance in the development of Pacific cartography. Two drafts of this map, varying in certain details, are known to exist, one in the Grand Ducal Library of Weimar, the other in the archives of the College of the Propaganda at Rome.¹ For most practical purposes the two maps of 1529 are the same, but in speaking of them in this place we have in mind the beautiful specimen in the Propaganda archives. (No. 40). It is generally agreed that the Ribero map is based upon the lost official map, the *Padrón real* kept for record and for the guidance of pilots and cartographers in the Casa de Contratación at Seville. The prime meridian of the map is the line of demarcation as established at the Treaty of Tordesillas. Degrees of latitude and longitude are so marked as to make clear the ideas of the accomplished royal cosmographer concerning the extent of the continents and oceans he depicted. It is of interest to us in this study to observe that the breadth of the Pacific is shown by Ribero as comprising about 134° from the westernmost coast of South America to the Moluccas, too small a measurement, but none the less a better statement than ordinarily found of the breadth of the great body of water which had been first navigated by a European some eight years before. In accordance with the portolano tradition of recording only things actually known, Ribero leaves blank a long stretch of the west coast of South America, and all the west coast of North America above Guatemala. At north and south the Pacific is without bounds. Ribero's contribution, and it was important, lies in his

¹ There is so great a likeness between the two Ribero maps of 1529 and an anonymous production of 1527, also at Weimar, that one feels agreement with Nordenskiöld's belief that the 1527 map also is the production of Ribero. HARRISSE, *Discovery*, p. 557, as Nordenskiöld points out (*Periplus*, p. 154), does not support this point of view.

relatively correct statement of the reciprocal positions of places in America and Asia, and in his approach towards correctness in his portrayal of the great breadth of the Mar del Sur. His 134° for an approximate 150° is good measuring in comparison with the 100° of Agnese for the same breadth, the 95° of Gastaldi, and the 97° of López de Velasco, all of them his successors in this delineation. A better idea of the breadth of the Pacific began to prevail after the publication in 1595, in Linschoten's *Reys-gheschryft*,² of the account of Francisco Gali's voyage from Macao to Acapulco, the first printed account of a return voyage across the Pacific.³ The maker of the Wright-Molyneux map of 1599 (No. 64) evidently read of this voyage in the English Linschoten of 1598, for one of the legends upon that celebrated and influential map reads as follows: "It appeareth by discoverie of Francis Gaille a Spaniard, in the yeare 1584: that the sea betweene the west part of America and the east of Asia (which hath bene ordinarily set out as a straight and named in most maps the streight of Anian) is above 1200 leagues wide at the latitude of 38 degr." Considering the east coast of Asia as meaning Japan, this estimate is too short by eight or nine hundred miles, but even with that considerable error involved, its publication upon a map of the currency attained by the Wright-Molyneux production must have done something towards conditioning the minds of reading men to the facts which eventually were to be forced upon them.

It is difficult sometimes to evaluate the influence of a manuscript map upon the general cartography of its time because one may not say what was the extent of its contemporary circulation. There is no such doubt in connection with the splendid Diego Ribero map of 1529, for the derivatives of it testify to the weight of its influence. The printed Ramusio map of 1534, for example, seems to have been drawn directly from it, and in the three plane maps which, with some overlapping, make up the mappemonde in

² See Section VIII. *The Dutch Explorations*.

³ Wagner, *Spanish Voyages*, passim.

the normal Agnese atlases, we find indications that in the beginning Ribero's map was their model, or, as Mr. Wagner prefers to put it, their model was "a map of the world which emanated from the Sevillian school of cartography, either the Diego Ribero planisphere of 1529 in the Propaganda Fide, Rome, or one like it."⁴

The Agnese Atlases

One may not speak of an Agnese portolan atlas or an Agnese world map and let it stand at that, disregarding the several elements of variety in the composition of the productions bearing that name. There were marked changes in the data and configuration of these maps at different times in the period of their production, roughly 1536-1564. In his definitive study of Agnese, Henry R. Wagner divides the sixty known atlases of this period into three types—Pre-Californian, Post-Californian, and Post-Californian with a new map of Scotland. The most significant member of the second or Post-Californian group is the atlas in The Pierpont Morgan Library dated May 15, 1542 (No. 47), the earliest Agnese now known to show on its map of the Pacific area the Perinsula of Lower California with place names arising from the Ulloa voyage of 1540. With its portrayal of the Moluccas and the Philippines in this map of the Pacific area, the portrayal of the western coast of America with but one break from the Strait of Magellan to Alta California, with the Indian Ocean map displaying the eastern coast of Asia far north along the China seaboard, we find in the Agnese atlas a composite mappemonde which strongly affirms a distinct increase of knowledge among cartographers with regard to the bounds of the Pacific. In the oval map of the world found in the Agnese atlases, a map based upon an older tradition and hospitable to some strange conceptions, Agnese stepped back a pace or two in time. It is one of the most decorative of all known maps of the world, but it repeats many errors long corrected even when about the year 1539 this map

⁴ Wagner, *Agnese*, p. 9.

was first constructed on the so-called Verrazano plan.⁵ A good deal of the mistrust expressed of Agnese as a cartographer must arise from this lovely anachronism which he generally placed in his atlases. In more than one particular, however, it is geographically important; not the least interesting of its features is its inclusion of a lightly traced silver line which indicates Magellan's track around the world, a thin line joining ocean to ocean and continent to continent, demonstrating graphically the new comprehension of the world brought about by that earliest circumnavigation.

Gastaldi and the Strait of Anian

The southern boundary of the Pacific, or, rather, the question as to whether it had such a boundary was to remain undetermined for another two centuries or more, but soon there were to appear maps in which the eastern and western shores laid down by Agnese were to be imaginatively extended and a northern boundary created. In Venice in the period of Agnese's greatest activity lived the geographer Giacomo Gastaldi. It is not to be expected that anyone in Venice in that period interested in mapmaking would escape the influence of the most distinguished maker of portolan atlases of the century, and so it is that we find the Gastaldi *Universale* of 1546 (No. 49) embodying some of the features and place names of the three maps which make up the Agnese map-monde. Gastaldi's *Universale* has long been recognized as "one of the most important maps of the 16th century." It was reproduced with variations in some fourteen or fifteen different forms between the year of its publication and 1576, and the version of

⁵ Verrazano's conception of a large gulf penetrating deeply the western coast of North America at about 35-40° was accepted by many cartographers. See I. N. Phelps Stokes, *Iconography of Manhattan Island*, New York, 1915-1928, 6 vols., Vol. II, pp. 11-17; W. F. Ganong, *Crucial Maps in the Early Cartography and Place-nomenclature of the Atlantic Coast of Canada III*, in: *Transactions of the Royal Society of Canada*, Third Series, Vol. XXV, Section II, 1931; and Wagner, *Cartography*, Vol. I, p. 7. The so-called Verrazano globes constructed by Robertus de Bailly, now in the Bibliothèque Nationale and The Pierpont Morgan Library, and the lost Verrazano map are described by Stokes and Ganong, and the globes by Stevenson, *Globes*, pp. 105-106.

it made in 1555 by Gerard De Jode became the basis for one of the most celebrated world maps of all time, that is, the Ortelius *Typus Orbis Terrarum* which appeared first in the *Theatrum* of 1570.⁶ In its several forms ^{6a} the Gastaldi concept carried a notion of the Pacific and its boundaries to many people who would never have come close enough to an Agnese atlas, always a production *de grand luxe*, to distinguish its features. It would be too much to expect, however, that as early as 1546 the boundaries of the Pacific delineated in it should be exact as to direction or configuration.

This map of 1546 drawn by Gastaldi gave authority and currency to the notion then prevailing in some quarters that North America was an extension of the Asiatic continent. His was not, however, the ancient error of Contarini, Ruysch, and Maggiolo (1511), all of whom located the explorations of Cortereal or of Cabot upon the peninsula-like northeast corner of the Asiatic coast, somewhere north of China. This was roughly the expression of Columbus's belief that his voyages had carried him to Japan and the eastern coast of Asia. It failed completely to recognize the existence of the land mass we know as the North American continent. The Gastaldi map embodied a radically different notion, for upon it is shown the eastern coast of Asia as far north as 40°, and, thrusting off from it at that latitude to the eastward and southward, without any break in land continuity, the great continent of North America. This conception of the land of Cabot and Cortereal not as a part of the northeastern coast of Asia but as an immense peninsula projecting some 110° eastward from the Asiatic continent seems first to have appeared upon the western hemisphere map, already described, of Franciscus Monachus, published about 1529. It had been accepted and portrayed in the Oronce Finé map of 1531. There existed, however, another conception of the relationship which probably went back to the Wald-

⁶ Tooley, No. 3, note.

^{6a} See Tooley, and Wagner, *Cartography*, Vol. II, for titles and descriptions of a number of world maps of Gastaldi origin.

seemüller portrayal in the map of 1507 of the continents as separated by a body of water. This conception appears with differences in Mercator's cordiform world map of 1538 (No. 45), a derivative in other particulars of the Finé map of 1531;⁷ in the Agnese oval world map; in the Tramezini world map in two hemispheres of 1554;⁸ in the copy of the Mercator cordiform made by Antonio de Salamanca (No. 50) about 1560; in the Mercator planisphere of 1569 (No. 52); and in the Ortelius world map of 1570.⁹ In some of these, notably in the Agnese world map, the separation is suggested rather than definitely portrayed; in the Mercator of 1538 and its copy, the Salamanca map, and in the Tramezini western hemisphere, North America is separated from Asia by a body of water which represents a gradual narrowing, almost to the dimension of a strait, of the Pacific Ocean.

This variation of opinion among the mapmakers seems to have been concentrated in the person of Gastaldi, who at different times in a short term of years held both views of the situation. After having done a great deal in his *Universale* of 1546 to establish a belief in the theory of Asiatic continuity, and influenced many mapmakers to follow his lead, this same accomplished geographer retracted his former opinion in a pamphlet of Venice, 1562, now lost, entitled *La universale descrizione del mondo*,¹⁰ setting up the theory that a relatively narrow body of water, which he called the Strait of Anian, led from the Pacific into the Arctic and separated the continents. It is a fact of interest that the basis of Gastaldi's change of belief was made up of elements in the narrative of Marco Polo.

It has been thought probable that at the time of publication of his pamphlet in 1562, Gastaldi issued a map in support of the new opinion set forth in that work. An unsigned and undated pro-

⁷ Tooley, No. 1, note.

⁸ Ibid., No. 18.

⁹ Ibid., No. 3, note.

¹⁰ George E. Nunn, *Origin of the Strait of Anian Concept*, Privately printed (The George H. Beans Library, Jenkintown, Pa.), Philadelphia, 1929, p. 33; Wagner, *Cartography*, p. 53.

duction was discovered in 1921 and acclaimed by Henri Vignaud as this map of which the existence had been postulated. Authorities differ, however, not only from Vignaud but from one another as to when that map was made and who was its author. So much is this the case that the Vignaud map cannot be fully accepted as the direct expression of Gastaldi's new idea, or of simultaneous publication with his pamphlet of 1562.¹¹ The Zaltieri map (No. 51) of Venice, 1566, now to be described, remains as that which is closest in time and space to Gastaldi and the expression of his new and correct hypothesis of 1562.

In the map, *Nova Franza*, brought out by Bolognino Zaltieri, the two continents, shown in close proximity, are separated by a narrow body of water designated by the name given it in the Gastaldi pamphlet, that is, *Stretto de Anian*, the first appearance of that name upon a printed map. (Plate XI.) Nearly two hundred years were to pass before the partial verification of the existence of such a strait was to be made by the 1728 voyage of exploration of Vitus Bering.¹² None the less, another step towards the correct delineation of the Pacific was made when the maker of the Zaltieri map accepted Gastaldi's change of belief and gave it graphic expression. It may be that the Zaltieri map is even closer in time to Gastaldi's pamphlet than is indicated by the date of 1566 under which it is usually entered, for there exist certain copies of the map without date, and there are convincing indications that these are from an earlier state of the plate.

The suggestion that the Zaltieri map of *Nova Franza* is earlier in date than 1566 does not mean that it may be related to the Gastaldi pamphlet as illustration to text. In all probability that pamphlet with its description of the whole world was prepared and issued as a commentary upon a world map constructed by the author to embody his latest accumulation of data and his current geographical conjectures. As indicated in an earlier paragraph

¹¹ Wagner, *Cartography*, Vol. I, pp. 57-58, discusses the Vignaud suggestion and reaches the conclusion here set forth.

¹² See Section X. *The Russian Discoveries*.

about the Vignaud discovery, there has been a good deal of discussion as to the identity of the map for which this distinction might be claimed. There exists a Gastaldi map, the *Cosmographia Universalis* (No. 51b), published by G. F. Camozio of Venice with the date 1569, which must be seriously considered in this association. In a study written some years ago by Mr. George H. Beans,¹³ who owns one of the two known copies of this so-called Camozio map, it is made reasonably clear that an unknown prototype of the work was the world map Gastaldi had in mind when in 1562 he wrote his lost book, *La universale descriptione del mondo*. Returning to the Zaltieri map of 1566, or earlier, Mr. Beans finds that it copies very closely the features of the northwestern portion of the Camozio map—including the Strait of Anian separation of Asia and America—but with differences of such a character as to indicate that it was copied from the Camozio prototype rather than from an earlier issue of the Camozio map itself. As that prototype and any probable issues of the Camozio map before that of 1569 have disappeared from knowledge, it remains true that the Zaltieri map of 1566 is closest in time to the Gastaldi pamphlet in which the Strait of Anian concept first found mention in geographical literature. Another important step had been taken in correctly bounding the Pacific, for its conjectural separation of the two continents by a narrow strait was a comfortable approximation to what we know to be the actual case.

The López de Velasco Maps

A Spanish manuscript of the Pacific important for other reasons than those which give distinction to the Zaltieri map, is found in a work entitled *Demarcacion y Division de las Indias*, composed as a summary of a large work by Juan López de Velasco, and existing in The John Carter Brown Library in a codex of the period 1575-1580. Four or five other copies of this manuscript are

¹³ *A Large World Map dated 1569*. By George H. Beans. Philadelphia, 1933. (With photostat copy of the map discussed.) Publications of The George H. Beans Library, Jenkintown, Pennsylvania.

known to exist in Spanish libraries, and printed publication was made of one of these in 1871.¹⁴ It was an expansion of this work which was published by Antonio de Herrera in 1601 as that part of his *Historia general* which we know as *Descripcion de las Indias Occidentales*. The manuscript before us contains in water color the fourteen maps which accompany Herrera's work in the form of engraved plates. One of these is a general map of the Indies, East and West (No. 55), twelve are sectional maps of North, Central, and South America, and the remaining one is an extensive map of the East Indies (No. 56). The first and last of these are of particular importance in our present study, though several of the distinctly American maps are likewise of interest as showing the development of knowledge of the Pacific coast of North and South America.

The universal map of the Indies in the López de Velasco codex portrays the Atlantic, the American continents, and the whole Pacific area as far as generally known at the time of its composition. Of chief interest among its features are these:

- the running of the eastern line of demarcation through the tip of the Malay Peninsula as drawn by Spain at the Congress of Badajoz in 1524, thus embracing within her hemisphere the Moluccas and the Philippines, Java, Borneo, part of Sumatra, Japan, and part of China;
- the portrayal of the Solomon Islands, discovered in 1568 by Alvaro de Mendaña;
- pricked lines showing the routes, to and fro, between Acapulco in Mexico and the Philippines.

¹⁴ See *Annual Report of The John Carter Brown Library for 1935-1936*, pp. 10-13, for a description of this manuscript as well as a reference to its publication, without maps, in 1871 from the copy in the Biblioteca Nacional, Madrid. The complete work of Lopez de Velasco, of which the *Demarcacion* manuscript is a summary, was published under the title *Geografía y Descripción universal de las Indias recopilada por el Cosmógrafo-Cronista Juan López de Velasco desde el Año de 1571 al de 1574, publicada por primera vez en el Boletín de la Sociedad Geográfica de Madrid, con adiciones é ilustraciones, por Don Justo Zaragoza*, Madrid, 1894. See also our appended List of Maps, No. 55.

We have discussed in an earlier chapter the outcome of the Spanish-Portuguese controversy over the location of the Spice Islands, and later we shall be writing at some length the story of the Solomons. At this point we may give attention to a curious and important factor in Pacific history introduced by the presence upon this map of the pricked lines showing the Mexico-Philippines route and return. Mariners had found relatively easy the outward voyage from Mexico or Peru to the Moluccas or the Philippines. The winds were favorable and the currents not adverse to their progress. The voyage home was another matter, for a steady northeast wind made it difficult for ships to take a direct easterly course. As early as 1528 this difficulty had been discovered by Alvaro de Saavedra Cerón, who had been sent to the Moluccas from Mexico to aid Loaysa in his attempt to possess Spain of those islands. Returning to Mexico Saavedra set a due easterly course for America, but after determined efforts to maintain it was compelled to return to the Moluccas. In his voyage eastward, however, Saavedra spent some time upon the coast of New Guinea, making the second discovery of the island first touched at by Meneses in 1526.¹⁵ In all there are recorded some five failures of Spanish vessels to reach Mexico from the Moluccas between 1528 and 1565. As the result of those failures it seems gradually to have become clear that the correct procedure might be to sail far enough north to escape the adverse conditions, and to meet the northwest winds prevailing in the forties. Two vessels returning separately from the Philippine Islands at the time of Legaspi's taking possession in 1565 followed this course, and, reaching Mexico in safety, established the route followed thereafter for a long period.¹⁶ Man's knowledge of the Pacific was

¹⁵ See C. R. Markham, *Progress of Discovery on the Coasts of New Guinea*, in: *Royal Geographical Society. Supplementary Papers*, London, 1886, Vol. I, p. 268; see also our Section VII. *New Guinea and the Solomons*, Note 4.

¹⁶ The question of whether the credit for the discovery of this route should go to one of Legaspi's commanders, Don Alonso de Arellano, or to Father Andrés de Urdaneta, Augustinian, ex-soldier, and formerly a member of the Loaysa expedition sent out in 1525 to take possession of the Moluccas for Spain, is discussed in Wagner,

added to importantly by this discovery of the return route to Mexico. The indication of that route upon the universal map of the Indies in the Velasco manuscript (Plate XII) is an early appearance of it upon a map, probably one of the earliest if we disregard the official maps placed in the hands of pilots in the government service. Other routes marked upon the map show the way followed by ships from Spain to Mexico and the West Indies, to and through the Straits of Magellan, northward to Lima and Mexico, and westward from Lima to the Solomons. At the time of composition of this map, however, the course from Lima to the Solomons had been sailed only once and then by Alvaro de Mendaña when he made his discovery of the islands in 1568. More than two hundred years were to pass before that route or any other leading to the group was again to be followed successfully.

The map in the López de Velasco manuscript entitled *Descripcion de las Yndias del Poniente* (Plate XIII) provides a wealth of detail not found in the universal map of the Indies. It shows the Philippines in some fullness, locates Japan with unusual accuracy for the times, outlines the northern coast of New Guinea, runs the line of demarcation through the tip of the Malay Peninsula, and gives for the first time on any map I have seen a relatively full delineation of the Solomons, the islands newly discovered by Mendaña. Here, for example, the island of Guadalcanal is named many years before the first printed appearance of the Solomons upon the Ortelius world map of 1587 (No. 57). In short, the two maps of the Velasco manuscript which we have been considering, even though they leave unsettled the question of a northern boundary of the Pacific, may be thought of as bringing to an end one era in the cartographical history of that ocean, for in them its eastern and western bounds are pretty well established. Its width,

Spanish Voyages, Chapter V. Even with that clarification of the issue before us, it still seems difficult to reach a decision between two contenders who accomplished the feat at about the same time.

furthermore, is displayed with some degree of understanding, though with considerable inexactness; the position of northern New Guinea is laid down; and the great empty spaces of the southeastern Pacific are partly filled with the island groups forming the archipelagoes we call Malaysia and Melanesia. Most of the increase of knowledge between the time of Magellan and the date of the making of these maps had occurred as the result of Spain's determination to get her share of the cloves of the Moluccas and the cinnamon and gold of the Philippines. This was Spain's heyday in Pacific exploration.

VI. THE FALSE CONTINENT, TERRA AUSTRALIS

ONE of the less beneficent results of the Magellan expedition was the confirmation of belief in that fabulous Antarctic continent which had been a figment of men's minds since the time of the Pythagoreans, and which for the two centuries and a half after the circumnavigation of 1522 was to haunt the geographers and to appear, now a pale ghost, now a more substantial apparition, upon the maps they produced. Passing through his strait, Magellan had for many days to the south of him the land which he called *Tierra del Fuego* because of the fires which from time to time he observed upon its shores. No specific statement survives from him as to whether or not he believed this to be continental land, but the name he gave it suggests that he did not think of it as an island. Contemporary geographers, at any rate, concluded that *Tierra del Fuego* was the tip of a southern continent separated from South America by the narrow strait through which the navigator found his way into the western ocean.

If it is true that Magellan had been influenced by the Schöner globe of 1515, he must have been predisposed to belief in the existence of a huge land mass immediately south of his course, for in that puzzling work of cartography, as previously suggested, the land called "*Brasilie Regio*," lying south of the false strait at 45° , presented all the appearance of a vast continent surrounding the South Pole. But that reflection is by the way; neither Schöner nor Magellan nor any man of that age had conjured into being this image of a vague continent to the southward. Belief in such a continent was almost as old as the record of human thought.

The theory of the sphericity of the earth, first advanced by the Pythagoreans upon no basis other than their desire to attribute the perfect form, that is, the sphere, to the world they inhabited, was shown to be susceptible of proof by Aristotle. That theory once accepted, a corollary to it was soon formulated: in order that

the equilibrium of the sphere be maintained it was a necessity of physics that there exist land masses in the south and west to act as counterweights to the masses of the north and east which formed the Oikoumene or inhabited world of Europe, Northern Africa, and Asia. These land masses were the Antipodes. Specifically the southern antipodes became known as the Antichthon. That theory was of the most remarkable persistence, bridging not the centuries but the milleniums. It was seriously advanced in the late eighteenth century by the English geographer Alexander Dalrymple, and in the more than two thousand years intervening it had never been without its advocates.¹

It would take too long to recount the story of the controversies which clustered about the theory of the antipodal lands in the ancient world. Did they exist at all, what was their extent in relation to the water areas of the world, were they habitable, and were they accessible? Those were the questions discussed by scientists, poets, and men of letters. Strabo and Pomponius Mela were among the geographers to whom its accessibility and habitability were matters of concern. Lucretius and Plutarch were opposed to the whole conception of the sphericity of the earth and were charged even in their time with having offered puerile objections to it. Cicero, on the other hand, in his *Dream of Scipio*, upheld the theory with intelligence and acumen. That fact is of particular importance because it was upon the basis of his comments that a whole cycle of maps, the Macrobius cycle, was constructed in the Middle Ages.

The chief and most violent opponents of the theory of the antipodes were not, however, any group of men of the classical era, but the Fathers of the early Christian Church. The hatred of it expressed by Lactantius, for example, carried over almost with

¹ More than once in the annotation of the previous chapters, reference has been made to Armand Rainaud, *Le Continent austral*, Paris, 1893, a work in which the whole subject of the mythical southern continent from the earliest times to the late nineteenth century is clearly, learnedly, and interestingly treated. The present chapter draws so extensively upon Rainaud's work that specific reference to its pages is in many cases omitted.

the force of dogma into the Middle Ages. In our earlier discussion of the ecclesiastical maps of that period it was shown that because of the rejection by their makers of the theory of sphericity those maps retained in essentials the form of the world as conceived by the Greeks of the Homeric age. There were, however, those who took exception to this position even among the churchmen. Saint Isidore of Seville conceded the probable existence of the southern antipodes and upon the basis of a single sentence or two from his pen the Beatus cycle of maps portrayed for centuries an unknown continent south of Africa and the Indian Ocean.

The long controversy was settled so far as the western antipodes were concerned when America was discovered and its great extent revealed. The desire to discover the southern antipodes, the Antichthon of the ancients, became thereafter one of the impelling motives of exploration. The story of the origin and the persistence of the belief in that continent, of the controversies which grew out of that belief, of the centuries of exploration in search of the elusive shores of the Terra Australis, is one of the most curiously interesting in the record of human thought and action. The maps in which the theory found delineation are a feature of much more than incidental interest in the present discussion.

The Maps of Beatus and Macrobius

The richness of an important American library makes it possible to begin our discussion of the place of the Terra Australis in world cartography by the reproduction of a map of the highest importance in the history of the concept. One of the possessions of The Pierpont Morgan Library best known to scholars is the celebrated Ashburnham manuscript, Morgan Ms. 644, containing the commentary on the Apocalypse written in the eighth century by the Spanish monk, Beatus of Liébana, a town and monastery in the Asturias. The curious dating of the manuscript leaves it an open question as to whether it was written and decorated in

894 or 926. But whether of the late ninth or early tenth century the map of the world contained in the manuscript (Plate II) is one of the very earliest cartographical documents now known to be in existence in original form. Certainly it is earlier by many years than any other map now to be found in America (No. 2).

This earliest of the Beatus world maps is rectangular in shape. In it the earth is surrounded by continuous ocean, the Indian Ocean appearing in the form of a straight, narrow band of water extending the width of the map south of Africa and Asia and connecting at either end with the earth-surrounding stream. South of that body of water is a strip of land representing the northern littoral of an austral continent. A legend upon that strip reads as follows:

Deserta Terra vicina solida ardore incognita nobis.
Desert land, neighboring [and] firm, unknown to us
[because of] the burning heat.

Here in a compressed statement is the notion of Isidore of Seville, churchman and saint, who indicated in his writings that he more than half believed in the sphericity of the earth and quite fully in the doctrine of the antipodes.² Saint Isidore was not consistent in the affirmation of his adherence to the theory, but the sentence from his *Etymologiarum*, quoted below, was repeated so often by his successors that it became the formula through which those of the Middle Ages who accepted the existence of the Antichthon expressed their belief. The chief influence in keeping the theory alive in that period was the maps of the Beatus cycle, the earliest of which has just been described. In another Beatus map found in The Pierpont Morgan Library, one of the thirteenth century (No. 4), there appears upon the land strip south of the Indian Ocean a fuller statement which is recognized as a quotation, with some curious errors, of the essential passage from the *Etymologi-*

² Rainaud, pp. 121, 131, and 136.

arum of Isidore of Seville. Transcribed that legend reads as follows:

Extra tres autem partes orbis quarta pars trans oceanum
interior est qui solijs ardore incognita nobis est culpīs
[sic] finibus anti podus [sic] fabulose inhabitare
produntur.

A rough translation of the passage, corrected by the text of Isidore,^{2a} results in the following statement:

Moreover beyond [these] three parts of the world, on the other side of the ocean is a fourth inland part in the south, which is unknown to us because of the heat of the sun, within the bounds of which the Antipodes are fabulously said to dwell.

Maps based upon another source joined with those of Beatus to keep alive the theory of a fourth continent lying to the south of the Oikoumene. In his *Somnium Scipionis* and elsewhere Cicero makes clear his belief in the theory of the Antichthon. In the sixth century A.D. Macrobius, in his *In somnium Scipionis expositio*, a work of great popularity in the Middle Ages, carries further the statement of Cicero concerning the habitable character of the southern zone. He affirms, however, that reason alone permits us to assume its habitable character, for the intervening torrid zone prevents us from ever knowing what the truth of that matter may be. The tenth-century circular map³ (Plate III) built upon the Macrobius exposition, and many which follow it from that source

^{2a} I owe thanks to Mr. Curt F. Bühler of The Pierpont Morgan Library for making this transcript from the map in Morgan Ms. 429, for locating the sentence in St. Isidore's *Etymologiarum* (Migne, *Patrologiae Cursus completus*, Latin Series, vol. 82, Column 512), and for the suggested English rendering of it given above. The sentence in the Migne text reads as follows: "Extra tres autem partes orbis, quarta pars trans Oceanum interior est in Meridie, quae solis ardore nobis incognita est, in cuius finibus Antipodes fabulose inhabitare produntur."

³ The earliest appearance of the map in printed form was in the edition of Brescia of 1483. See M. B. Stillwell, *Incunabula in American Libraries. A Second Census*, New York, 1940, M 5.

(No. 16), form a cycle of cartographical documents in which a bowl-shaped continent at the south of the circle is described as antipodal land unknown to us, a concept not unlike that found upon modern maps drawn to embody the conjectures of Pomponius Mela.⁴ More than one printed edition of Macrobius of the fifteenth century preserves this concept in its woodcut map. Thus the idea of the Terra Australis came to the Middle Ages with double authority—the belief in the theory expressed by St. Isidore of Seville, embodied graphically in the maps that accompanied certain manuscripts of the Beatus Apocalypse, and the acceptance of it by Cicero, transmitted by the commentary and map of Macrobius.

The Terra Australis after Magellan

It is clear from what has been written that when Schöner showed a vast "Brasilie Regio" centering upon the South Pole he was carrying on an unsubstantiated theory which his age had received from the Greek scientists of antiquity, men who had postulated the existence of a southern continent as a counterpoise to the weight of the known world of the north temperate zone. The identification of Tierra del Fuego as the northern tip of an austral continent not hitherto seen by European man may, therefore, have been as exciting to some of the learned contemporaries of Magellan as the fact of his circumnavigation of the globe.

It has already been said in another connection that the earliest map to show the Strait of Magellan was also the earliest upon

⁴ One modern drawing of the world map upon the basis of Pomponius Mela's conception is found in Vincent, *The Commerce and Navigation of the Ancients in the Indian Ocean*, London, 1807, 2 vols., II, p. 563, and another in Schoff, *Periplus*, p. 100. The Schoff drawing, from Justus Perthes, *Atlas Antiquus*, shows Taprobana (located, as customarily was done, in the position of Ceylon) as the northeastern tip of a great bowl-shaped island running the breadth of Asia and Africa westward to the Atlantic and separated from those continents by a body of water called by three different names from east to west—"Indicus Oceanus," "Rubrum Mare," and "Aethiopicum Mare." That vast island-continent is designated "Antichthones." The cartographical representation of Taprobana, which was really Sumatra, though normally located in the position of Ceylon by the mapmakers down to the early sixteenth century, is one of the most curious in the history of cartography.

which the land immediately to the south of it is portrayed as a southern continent extending to the South Pole. This was the tiny world map in eastern and western hemispheres found in the work *De Orbis Situ* of Franciscus Monachus, published, recent investigations show, about the year 1529. That small production seems in more ways than one to have influenced Oronce Finé, whose *Nova, et integra universi Orbis Descriptio*, dated 1531, is normally found in the Grynaeus, *Novus Orbis*, of Paris, 1532. In that beautifully executed double-cordiform map of Finé, the southern continent is given the name by which it was to be generally known for more than two centuries, "Terra Australis," Land of the South. In many particulars, as in the portrayal of a Terra Australis, the double-cordiform Mercator world map of 1538 followed the example set by Finé, as at a later period did the great Mercator nautical chart of 1569 (No. 52). To realize the extent to which belief in the Antarctic continent renewed itself in the imaginations of geographers after the Magellan voyage, it is necessary only to run through Nordenskiöld's *Periplus* and *Facsimile-Atlas*. An extraordinary statement of the theory at a relatively early period is found in its portrayal in the *Periplus* in the great world map of Pierre Desceliers, of 1546, formerly known as the *Mappe-monde de Henri II*. In the *Facsimile-Atlas* one observes an extensive representation of the continent in the maps of Thomaso Porcacchi, 1572, Mercator, 1587, Joannes Myritius, 1590, Cornelis de Jode, 1593, and Matthias Quadus, 1608.

The extreme limit of credulity in respect to the Terra Australis was reached in the second half of the sixteenth century after the idea had been nurtured by two generations of cartographers. In the well-known map *Americae sive Novi Orbis* (No. 53), found in the *Theatrum* of Abraham Ortelius, of 1570, the southern continent crosses the Pacific from the tip of South America, joins the land mass believed to lie south of New Guinea, and runs northward almost to the equator with New Guinea as its northernmost extension. In the world map, the *Typus Orbis Terrarum*, in this

same atlas and the edition of 1587, the southern continent runs entirely around the world, occupying an area greater than that of North and South America combined. Here was the complete expression of the idea of the balancing of weights necessary to the equilibrium of the earth. (Plate XIV.) Among the later maps in which the southern continent is portrayed as fully encircling the globe are the world map and western hemisphere map found in the *Ta' rikh al-Hind al-Gharbi*, a description of the New World in the Turkish language, printed at Constantinople in 1730.⁵ Upon the southern continent in the nicely rendered copperplate world map in this rare book, appears a legend designating this area as the "land of unknown conditions."

Not every cartographer of the period, however, was carried away by the newly aroused interest in the southern continent. The great manuscript *Carta universal* of Diego Ribero of 1529 portrays only the shores which Magellan saw from the deck of his ship, making no suggestion by the depicting of a vague shape of land extending southward that Tierra del Fuego was the northernmost out-thrust of a southern continent. The cartographer and maker of portolan atlases of great celebrity, Baptista Agnese, was doubtless influenced in this, as assuredly he was in other things, by Ribero, for in his plane map of America, he follows the Spanish pilot's procedure of showing only what was known. In his oval map of the world, however, a map anachronistic in many details, Agnese goes far towards expressing a belief in the presence of continental land south of Magellan's Strait, though not so far, perhaps, as his fellow citizen of Venice, Giacomo Gastaldi, who in his map of 1546 was to suggest the existence of a land mass of large dimensions in that area. The woodcut map of America known as the Ramusio map, of Venice, 1534, a straight derivative of the Ribero map, follows that production in its omission of con-

⁵ See Sabin, No. 94396; J.C.B. Catalogue (1875), No. 463, gives a different transcription of this title. A synthesis of current and earlier European cartographical theories, this map carried to its Turkish readers several false notions of the geography of both the South Pacific and the North.

tinental land south of the Strait. The Cabot map of 1544 (No. 48) is non-committal on this point in the same sense as the map of Ribero and its derivatives.

The voyage of Sir Francis Drake around the world in 1577-1580 did something to dissipate the idea of a Terra Australis, at least in so far as concerned the concept of a continent to the southward of South America. Drake was storm-driven into that part of the ocean commonly supposed to be occupied by the unknown land, and found himself south of Tierra del Fuego in an intricate archipelago with no evidence of continental land to the south of him.⁶ The unknown maker of the celebrated world map of Paris, 1587 (No. 59), found in Hakluyt's edition of Peter Martyr's *De Orbe Novo*, seems to have been affected by reports of Drake's experience, as was also the maker of the Wright-Molyneux world map, published in Hakluyt's *Principal Navigations* of 1598-1600 (No. 64). Both these skilled and thoughtful cartographers show to the south of the Strait of Magellan a group of islands rather than continental land. Their knowledge of the Drake association with this part of the world is indicated, in the one case, by the delineation of an island west of Tierra del Fuego with the legend "Ins Reginae Elisabetae 1579 ab Anglis," in the other, by an island south of Tierra del Fuego called "Queens Iland." These are one and the same island. Drake sheltered at this island from the great storm which drove him southward, and upon the basis of the narrative of his voyage it was located upon many maps of the ensuing two centuries. Eventually, however, it disappeared from the maps because no one in later years succeeded in identifying or relocating it. A recent study of the subject suggests that it once occupied the position designated on today's charts as Burnham Bank.⁷ The only trace of the mythical

⁶ A most satisfactory discussion of Drake's experience and his discovery of open sea south of Tierra del Fuego is found in Henry R. Wagner, *Sir Francis Drake's Voyage around the World*, San Francisco, 1926, pp. 81, 88-98. See other references in the index of that work under Antarctic Continent.

⁷ Felix Riesenbergh, *Cape Horn*, New York, 1939, makes this suggestion, developing it most interestingly and in such a way as to establish probability.

continent upon the Wright-Molyneux map is the faint indication of the point of land south of Java which for a long time on maps of the sixteenth and seventeenth centuries was called the province of "Beach," an error derived from a misreading of the Marco Polo narrative of the thirteenth century.

The question of the existence of a land mass south of Magellan's Strait was not cleared up by the Schouten-Le Maire expedition of 1616, in which for the first time the Pacific was entered from the Atlantic by the rounding of Cape Horn, nor was the question greatly clarified by the book and map of the Nodal brothers, sent out by the King of Spain in 1618 to examine the Le Maire strait and study the possibility of maintaining control over this new passage into the Pacific. The existence of the southern continent was so strongly fixed in the minds of men of the time that they held on to it even after Le Maire and Schouten had proved Tierra del Fuego to be an island. In its place as the promontory of the Terra Australis the geographers now set up the small island, Staten Landt, which formed the eastern shore of the new-found Le Maire Strait.⁸ Once around the Horn the Dutchmen sailed northwestward across the Pacific and explored the northern coast of New Guinea, incurious, it seems, about the continent which they supposed lay south of their strait. The Nodals passed around the Horn through Le Maire's strait, turned northward, and sailed back to Spain by way of the Strait of Magellan. They designated Staten Landt as "la tierra Incognita" and showed it on their rare map (No. 68) with an indefinite eastern extension.⁹ In his expedition against the west coast of South America in 1643, Hendrik Brouwer was driven out of Le Maire's strait and forced to round Staten Landt from east to west, proving clearly that it was a small island and not the tip of the

⁸ *Journal ofte Beschryvinghe van de wonderlicke reyse ghedaen door Willem Cornelisz Schouten van Hoorn, inde Jaren 1615. 1616. en 1617*, Amsterdam, 1618. See J. C. B. Catalogue (1919), Vol. II, Part I, p. 129.

⁹ *Relacion del Viaje que . . . Hicieron los Capitanes . . . Nodal . . . al descubrimiento del Estrecho nuevo de S. Vicente*, Madrid, 1621. See J. C. B. Catalogue (1919), Vol. II, Part I, p. 156.

austral continent.¹⁰ But belief in the existence of a southern continent was so ingrained in the seamen and geographers of this generation that it was affected hardly at all by the experiences of Drake and Brouwer and only confirmed by those of Le Maire and the Nodals.

In the circumpolar world map (No. 76) which Louis de Mayerne Turquet published in Paris in 1648, New Guinea is shown as an island off the shore of "Terre Australe Incognue," which, beginning at Staten Landt, encircles the world. A break in its coast just west of the Strait of Magellan indicates some degree of uncertainty on the part of Mayerne Turquet, implanted there probably by the experiences of Drake, Le Maire, and the Nodals. Tierra del Fuego is drawn in this interesting map as an island completely detached from the Terra Australis.

The Terra Australis appears in seventeenth-century satire in the form of Bishop Hall's *Mundus alter*, published in Latin at Frankfurt in 1605 and in English as *The Discovery of a New World*, London, 1609.¹¹ The Bishop's new world was the "Terra Australis Incognita" of contemporary geography. Of this so-called "unknowne Southerne Continent," he asks pertinently, "If they know it for a Continent, and for a Southerne Continent, why then doe they call it unknowne?" Thereafter he proceeds to a minute description of the many divisions of the land; he denominates the whole area as "the South Indies bordering upon Terra del fuego," and divides it into three great states,—Tenter-belly, Shee-Landt, and Fooliana—and each of these in turn into provinces and cantons of a similarly burlesque nomenclature. The Bishop's satire appeals to us today chiefly as a curiosity, but the maps which

¹⁰ Hendrik Brouwer, *Journael Ende Historis verhael van de Reyse gedaen by Oosten de Straet le Maire*, Amsterdam, 1646. The specific reference is to p. 16. See J. C. B. Catalogue (1919), Vol. II, Part II, p. 338.

¹¹ See J. C. B. Catalogue (1919), Vol. II, Part I, pp. 31, 46, and 60; Vol. II, Part II, p. 304, for Latin editions of Frankfurt, 1605 (first), Hanover, 1607, and Utrecht, 1643, and for the English edition of London, 1609. But see also *Short-Title Catalogue*, No. 12685, which suggests London as place of publication of the first edition of 1605. For a modern study, with text in English, see *The Discovery of a New World*, edited by Huntington Brown, Cambridge, 1937.

accompany the Latin edition of 1605 are of genuine imaginative quality and truly amusing, embodying as they do the geography of the normal maps of the time, and, south of the older and correctly delineated continents, this new world of fantastically named countries and districts, rivers, lakes, and mountains (No. 66). This is what we might describe as having fun with geography, the same sort of fun that Dean Swift had when, more than a century later, he equipped his *Travels of Lemuel Gulliver* with a series of Pacific maps in which the fantastic appears in a similarly unexpected relationship with the true.

The Terra Australis as an Incentive to Exploration

It seems to be a fact that for some two centuries and a half after the passage of the Strait of Magellan in 1520, the hope of making discovery of the Terra Australis was a strong motivation of Pacific exploration. Alvaro de Mendaña set out in 1567 to seek "certain islands and a continent" in the South Sea. Though he found no continent, his discovery of the Solomon Islands and his exploration of them added data of considerable importance to the slowly growing record of Pacific discovery. In a later chapter that story will be told in greater detail.

Another celebrated voyage undertaken through the allurements of the undiscovered Terra Australis was that of Schouten and Le Maire, already spoken of, whereby in 1616 Cape Horn was first discovered and rounded. The historian of that voyage recorded that on October 25, 1615, soon after the crossing of the Equator, the leaders of the expedition first "told us what voyage they intended, which was, to seeke by an other way then the straights of Magelan, to enter into the south sea, there to discover new countries in the South parts, where they thought to finde great riches, and that if it fell not as they desired and pretended, then that they would saile along through the great south Sea, . . . to the east Indies."¹²

¹² Page 13 in the English edition, *The Relation of a Wonderfull Voiage made by William Cornelison Schouten of Horne*, London, 1619. The omission indicated

The continuity of Spanish interest in the Terra Australis is found in the exploits of Pedro Fernandez de Quiros. When, nearly a generation after his discovery of the Solomons, Mendaña at last set out from Peru in 1595 to colonize his islands, the chief pilot of his fleet was Fernandez de Quiros, who through the death of his leader was forced into command of that futile expedition. Returning to Peru and thence to Spain, Quiros besieged the king until a royal cedula of 1603 sent him forth once more upon a voyage to explore the South Sea for the lands which were believed to extend from the Strait of Magellan to New Guinea. Quiros reached what was much later named the New Hebrides, and thinking that the large island Espíritu Santo was continental land, took possession of the long sought Terra Australis in the name of Spain, naming it, with the Emperor's fief of Austria in mind, Austrialia del Espíritu Santo. Again Quiros and futility seemed to spell the same thing. None the less, it was on this voyage that the pilot Luis Vaez de Torres was driven into the mouth of the strait which bears his name, and sailing through it demonstrated the insular character of New Guinea.¹³

In the period 1607 to 1610 Quiros sent the king some fifty memorials begging support in the form of money and men to colonize the southern continent which he believed he had found. The seventeenth-century literature associated with the Quiros projects and actual expeditions comprised twenty-five or more printed titles or editions of titles in Spanish, Latin, French, Eng-

by the three dots in the quotation is of the mistranslated word "southward" for the Dutch "soude."

¹³ Sir Clements Markham, *The Voyages of Pedro Fernandez de Quiros, 1595 to 1606* (The Hakluyt Society, Second Series, No. XIV, 2 vols., London, 1904.) In this work are found Markham's learned introduction, translations of the essential narratives and documents relating to the expedition, a *Comparative List of Maps of the New Hebrides, Etc., 1570-1904*, and a bibliography. In 1930 Henry Newton Stevens and George F. Barwick published (The Hakluyt Society, Second Series, No. LXIV) *New Light on the Discovery of Australia as revealed by the Journal of Captain Don Diego de Prado y Tovar*. This valuable addition to the literature which has grown up around the figure of Quiros illuminates the expedition as a whole but particularly that part of it which has to do with the Torres discovery of the strait between Australia and New Guinea.

lish, Dutch, and German.¹⁴ The Terra Australis meant another new world, and, being an undiscovered world, remained a challenge to the human spirit.

Whatever may have been the expressed motives of the next century and a half, or more, of exploration of the Pacific—the Dutch in the Indies and on the coast of Australia, the English and Dutch buccaneers on all the coasts, the French with their great Compagnie des Indes Orientales—there seems never to have been far from the minds of the leaders and projectors the discovery of the great continent of the south.

Captain Cook and the Terra Australis

The search for the continent which did not exist, at least in the form in which it had been envisaged, presents throughout its course a moving scene in the *comédie humaine*. Hardship, death, disappointment had been its components for centuries of endeavor. Its closing scene was not unworthy of what had gone before. In 1768 Lieutenant James Cook of the Royal Navy was ordered to Tahiti in command of an expedition to observe the Transit of Venus which was to occur in the following year. That event of cosmic magnitude drew the astronomers and mathematicians of all countries forth from their studies and sent them to chosen stations throughout the world to record the attendant phenomena. Alexander Dalrymple, a young man in the service of the East India Company, who had already established some degree of reputation as geographer and traveller, felt that the command of this expedition should have gone to him rather than to a middle-aged naval lieutenant known theretofore only for a survey of the Newfoundland coasts in the course of which he had recorded the eclipse of the sun in 1766.¹⁵ Dalrymple had published in 1767 a map of the South Pacific upon which he had shown the tracks of voyages made in that sea before 1764, and had indicated by a

¹⁴ See "Bibliography" in Markham, *Quiros*, pp. xlvi-xlvii.

¹⁵ A summary statement of Cook's search for the southern continent and of his controversy with Dalrymple is found in Rainaud, Chapter XV.

legend the "Tierra del Esp.^o Santo or Manicola," claimed by Quiros to be the northern extremity of the southern continent (No. 99). This map accompanied his book of that year, *An Account of the Discoveries made in the South Pacifick Ocean Previous to 1764*.¹⁶ The purpose of the book and map was to set forth Dalrymple's grounds for belief in the southern continent. While Cook was in the midst of the first of the great voyages (1768-1771) which gave him fame as navigator and explorer, Dalrymple published in 1770 and 1771 a more ambitious work, embodying the map of 1767 and a history of Spanish and Dutch voyages in the South Pacific. *An Historical Collection of the several Voyages and Discoveries in the South Pacific Ocean*¹⁷ was the affirmation of a settled faith in the existence of the austral continent. Its author should have been warned of coming events when in 1769 Bougainville, returned from conducting the first French expedition to circumnavigate the globe, reported that the Austrian Land of the Holy Spirit, which Quiros had assumed to be the continental land of the south, was in fact a group of islands which he himself had explored and to which he had given the name "L'Archipel des Grandes Cyclades."^{17a} That discovery, however, was only a minor blow to the cause of which Dalrymple had made himself the champion. Cook returned to England in 1771 with the log of a voyage southward from Tahiti over open sea in areas where Dalrymple supposed land to lie. Furthermore, he had circumnavigated New Zealand, thought by its discoverer, Tasman, to be part of the southern continent. He had coasted the eastern shores of Australia and sailed through Torres Strait, thus completing proof that Australia and New Guinea were islands detached from a continental land mass. These explorations erased from the maps and from most men's minds the portion of the southern continent

¹⁶ Maurice Holmes, *An Introduction to the Bibliography of Captain James Cook*, R. N., London, 1936, No. 31.

¹⁷ *Ibid.*, No. 32.

^{17a} Plate 10 in Bougainville's *Voyage autour du Monde*, Paris, 1771, is a special map of the group, "... Archipel des Grandes Cyclades."

supposed to lie between the west coast of South America and New Guinea. Dalrymple's contention thereafter was that another great northward extension of the continent would be found in the Atlantic between Cape Horn and the Cape of Good Hope.¹⁸ Here was the projection from the southern continent which in the Ortelius world map of 1587 ran northwards to almost 40° south latitude. Curiously this "Prom. Terre Australis," as Ortelius designates it, is portrayed forthrightly in that Turkish world map of 1730 to which previous reference has been made in this section on the southern continent.

The refutation of his theories was not gracefully accepted by Dalrymple who, like so many before him, believed firmly that a southern land mass was a logical necessity, an essential element in the maintenance of the equilibrium necessary to the motion of the earth. While Dalrymple was engaging in a pamphlet controversy with Cook's editor, Hawkesworth, on the veracity of the Cook report of the 1768 voyage, the great navigator sailed away on his second voyage, exploring in the course of it the higher south latitudes of the Indian, Pacific, and Atlantic Oceans, demonstrating the absence of land in the South Atlantic where for centuries it had been supposed to exist and where Dalrymple had proposed to settle a colony. Once more the principle of personal reconnaissance had won the day; the theoretical had fallen before the practical. Dalrymple's theories were buried under the accumulation of exact data displayed in Cook's *A Chart of the Southern Hemisphere*, published in 1777 and found normally in Cook's *A Voyage towards the South Pole* of that year (No. 101).

But despite Cook's destruction of the theory of a Terra Australis as conceived by the geographers the story was not thereby

¹⁸ Dalrymple's most concise statement regarding the southern continent seems to be that section of *An Account*, 1767, pp. 69-103, in which appear his two discussions headed "Conduct of the Discoverers in the Tracks they made choice of" and "Investigation of what may be farther expected in the South-Sea." These two articles, considerably revised, are appended to Volume II of his *Historical Collection*, 2 vols., London, 1770-1771, where, separately paged, they occupy pp. 1-20.

fully told. The true Antarctic Continent refused to be laughed off. Cook, indeed, made no effort to laugh it off. On the contrary he who destroyed the old theory immediately substituted for it the postulate that land must exist at the South Pole to serve as the matrix of the fields of ice found in the Antarctic area. We know today that the grounds of the assumption were erroneous, but we know also that a continent was there all the time far beyond the latitudes in which formerly it was supposed to lie, the continent we know as Antarctica, a cozy piece of land, one-third as large again as the continent of Europe. Postulated in the eighteenth century by Cook, roughly surveyed and outlined in the nineteenth by Wilkes and Ross, it was penetrated deeply in the twentieth by Scott, Shackleton, Amundsen, and Byrd, doughty men striving to remove the term "incognita" from its earlier designation. Long before that time the vast and indefinitely outlined province of "Beach," concerning which we shall have more to say in a later section, had slowly become the solid fact we know as the continent of Australia.

VII. NEW GUINEA AND THE SOLOMONS

IN the same Ortelius *Theatrum* of 1570 in which the American or New World map showed New Guinea as the northern tip of the Terra Australis, another map of historic importance, the Ortelius *Typus Orbis Terrarum* (No. 54), portrayed it as an island separated from the Southern continent by a strait. Beneath its name in this delineation is a legend which informs the reader that it was uncertain whether the land so designated was an island or part of the southern continent. This was a fair statement on the part of the geographer of the prevailing uncertainty concerning New Guinea—whether it was an island or the farthest north of the Terra Australis was a question which puzzled men in 1570 and was to continue puzzling them for a good many years.

New Guinea, or Papua, seems to have been briefly sighted in passing as early as 1511 by the Portuguese mariner Antonio de Abreu. It was not until 1526 that its shores were actually visited by Europeans. In that year the Portuguese Jorge de Meneses was sent from Malacca to take over the administration of the Moluccas. Attempting to approach the islands by a new route around the north of Borneo he sailed far beyond his island destination and found himself making his landfall upon a strange coast. Here at an anchorage near the northernmost point of the island we know as New Guinea, he waited some months for the change in the monsoon by means of which he might be carried westward to his post in the Moluccas.¹ Late in 1526 the island of Gilolo of that group had been occupied by a small band of Spanish adventurers who, unsupported, were now in precarious possession of the place. It may be that if Meneses, back in Ternate in May, 1527, had not been met by the necessity of expelling these intruders from his government he would have had more to say to his contemporaries

1. Markham, work cited in Section Five, Note 15.

about the strange shore with its black, kinky-haired inhabitants to which chance had led him the year before.

The company of Spaniards which he found at Gilolo had been sent out to occupy the Moluccas by the Emperor Charles V in 1525 under command of Fray García Jofre de Loaysa. This action was Charles's answer to the failure of the Congress of Badajoz to fix the whereabouts of the line of demarcation in the eastern world. When Loaysa finally landed at Gilolo, the fleet of five ships which had set out with him from Spain had dwindled away to a single vessel and his small army had shrunk to a discouraged company of about a hundred men, an ineffective force for the removal from the islands of the rival Portuguese. When the leader of the expedition died, the survivors dug in and awaited succor. As already mentioned in another association, a relief expedition was sent out from Mexico by Cortés under the command of Alvaro de Saavedra Cerón. In returning from the Moluccas, Saavedra set a straight easterly course for the American continent, making the navigational error which many after him were to repeat until they learned that prevailing winds made that course all but impossible. He sailed with difficulty some hundreds of miles eastward from the Moluccas and was finally forced to anchor upon a coast which we recognize as the northern seaboard of New Guinea. There he gratefully sheltered against the contrary northeast wind which had been preventing his progress eastward. Before returning to the Moluccas, he took advantage of his position and explored a hundred leagues or so of the coast where he had found refuge and to which he gave the name Pápuas.

This coastal survey by Saavedra Cerón was the first exploration of New Guinea,² and between the year of its occurrence, 1528, and

² The story of the Loaysa expedition and the consequent discovery of New Guinea by Saavedra occupies Volume 5 of Martín Fernández de Navarrete, *Collección de los Viages y Descubrimientos que hicieron por Mar los Españoles*, 5 vols., Madrid, 1825-1837, Volume V, *Expediciones al Maluco. Viages de Loaysa y de Saavedra*. A very interesting collection of narratives and documents in English telling the same story is Sir Clements Markham, *Early Spanish Voyages to the Strait of Magellan* (The Hakluyt Society, Second Series, No. XXVIII), London, 1911.

the appearance of the Ortelius atlas in 1570, so little attention had been given that land by traders and explorers that no man yet might say whether it was insular or continental in character.

New Guinea shown to be an Island

In 1605 there set out westward from Callao in Peru two ships and a launch under Pedro Fernández de Quiros, mariner and ardent promoter, who had finally, after years of solicitation, attained royal backing for his project to discover the Terra Australis. In the foregoing section we have told of his discovery of the island of Espíritu Santo in what we now know as the New Hebrides, and of his taking possession of it in the name of the King in the conviction that it was part of the southern continent he had come to discover. So far the record is clear, but for some reason never fully explained, Quiros now sailed away from the bay in Espíritu Santo where his squadron was anchored, leaving no word for the officers of the ship he left behind him. That ship under command of Diego de Prado y Tovar and Luis Vaez de Torres continued westward, carrying out the orders under which the expedition was operating. Exigencies of navigation forced it into a body of water south of New Guinea which turned out to be the strait separating that island from Australia, the passage which afterwards was given the name Torres Strait. Thus was demonstrated the insularity of New Guinea,³ though the significance of that fact did not become widely known until 1762, when upon the capture of Manila by the English, a copy of the report made by Luis Vaez de Torres to the King, under date of July 12, 1607, came into the hands of Alexander Dalrymple. That learned geographer is said to have designated the strait by its present name upon the basis of the letter then discovered in the Philippine Archives. At any rate we find the route of Torres through the strait indicated, and credit given the Spanish navigator, upon the map

³ The sources for the Quiros, Prado y Tovar, and Torres expedition are named in Section VI. *The False Continent*, Note 13.

of 1767 in Dalrymple's *Account of the Discoveries made in the South Pacific Ocean Previous to 1764*.

The failure of Spain to follow up the supposed discovery by Quiros of the Terra Australis and the further and genuinely significant discovery of Diego de Prado and Luis Vaez de Torres is to be accounted for through weakness rather than through ignorance of their feats. Full reports of the expedition and its continuation were made to the Spanish authorities. Quiros, as recorded in the foregoing section, bombarded the King with petitions for a commission to carry on further discovery and settlement, but the Council of State in a report of 1608 advised his Majesty against the project. Spain, the report said, was already so short of manpower and of money that it could not occupy new lands, and if any were to be discovered by Quiros, it would "open a way for Your Majesty's enemies to go to occupy them That this Pedro Fernandez de Quiros has got it into his head to be a second Columbus," and fearing he would, if discouraged, turn over his knowledge and services to those enemies, it recommended he "should be retained here as cosmographer . . . and in this way everything will be settled, namely, not to make known or publish what this man has discovered, nor to drive him to despair . . . and to retain him and get from him all the profit that may be possible" Spain, as this significant document indicates, had shot her bolt so far as leadership in Pacific discovery was concerned.⁴

A few lines in the Torres letter of 1607 and in the report of Diego de Prado commenting upon the islands that lay to the south of their passage through the strait have been taken as warrant for acclaiming these two mariners as the discoverers of Australia. The plotting of their passage upon a modern map does indeed take them close to the tip of Cape York, but it can hardly be that either of them thought of what they saw there and thereabouts as anything but scattered islands, for if they had seen enough to suggest

⁴ Stevens and Barwick, pp. 210-213, work cited in Section VI. *The False Continent*, Note 13.

the presence of continental land, they would most certainly have acclaimed it as the shore of the Terra Australis and made much ado about its discovery.⁵ But they did nothing of the sort; their pride was in having shown New Guinea to be an island and in having navigated hundreds of leagues along an unknown shore. It is, therefore, as an element in the history of New Guinea rather than of Australia that we regard the voyage of these notable Spanish mariners.

The failure of Spain to follow up the exploration of Prado de Tovar and Torres was not an isolated instance of neglect in the story of Pacific exploration. That sea was so large and its shores and off-shore island groups so numerous and so rich that few men cared for the gamble in time, men, and equipment which pure exploration demanded. By this time Spain was bent upon consolidating her scattered empire, Portugal had lost the impetus which led her to the great discoveries of the fifteenth and early sixteenth centuries, and the Dutch were busy in a dream of wealth and empire in Java and the islands west of the New Guinea area. The northern coast of the great island became fairly well known. Schouten and Le Maire visited it in their circumnavigation of 1616, and it became one of the points of reference of navigator and cartographer, but beyond that was silence. It was not until 1793 that it was permanently occupied by a European power. In that year its northwest portion was taken over by the Dutch East India Company.

Discovery of the Solomon Islands

In 1567, an active governor of Peru, Lope García de Castro, appointed his nephew Alvaro de Mendaña to the command of an expedition sent out to discover islands and the continental lands of the South Sea.⁶ It was in the course of this voyage that Men-

⁵ Idem, pp. 69-71.

⁶ Lord Amherst of Hackney and Basil Thomson. *The Discovery of the Solomon Islands by Alvaro de Mendaña in 1568*. (The Hakluyt Society, Second Series, Nos. VII and VIII) 2 vols., London, 1901.

daña made his discovery of the group which soon came to be called the Islas de Salomon, because of a quickly circulated rumor that in them lay another source of wealth equal to that lost land of Ophir from which Solomon had drawn his riches. In the course of a stay in the Solomons of several months, Mendaña and his men made an extensive exploration, coasting the shores of many islands of the group and naming Santa Ysabel, Guadalcanal, San Christóval, and others of the group. There was no tendency on the part of Mendaña and his contemporaries to regard the discovery of this group of islands as unimportant, though some years were to pass before it found representation upon the printed maps. They must, of course, have been located upon official maps for the information of the authorities in Spain, and it was doubtless from one of these and from the reports of Mendaña and his pilot Gallego that the group found its way into López de Velasco's *Demarcacion y Division de las Indias*, a manuscript which we have spoken of more than once in this work, and described as proceeding from the period 1575-1580. Among its maps are discovered two extremely early portrayals of the Solomons, one in the general map of the Indies (No. 55), the other in the map of the Pacific area entitled *Descripcion de las Yndias del Poniente* (No. 56). (Plates XII and XIII.) There is found in this work also a section which, some twenty-five years later, Herrera made the basis of his chapter on the Solomons in the *Descripcion de las Indias Occidentales*, published as part of the *Historia general* of 1601. One might expect the López de Velasco source to share the criticism which has been made of Herrera's account of the discovery of the Solomons in which the name of the discoverer is incorrectly put down as Mendoça. But that is not the case. If the *Demarcacion* is not full on this point, it is at least not inaccurate. It is, indeed, silent on the question of the discovery.⁷

⁷ See Section V. *The Pacific is Given Bounds*, Note 14.

The Solomons are Lost and Found Again

In that López de Velasco general map of the Indies, as remarked elsewhere, are shown pricked lines indicating most interestingly the courses of the ships engaged in the trade between Spain and the East and West Indies. One of these pricked routes runs from Peru to the Solomon Islands. That was sheer optimism. No ship, so far as recorded, followed Mendaña to the Solomons for many a long day. In 1595, after twenty-seven busy years in other employment, the discoverer himself set out to colonize and exploit the islands he had been the first to see. Strangely enough, he was unable to find them again, and from that time until d'Entrecasteaux relocated them nearly two centuries later they were lost to the knowledge of European man. The story is a curious one.⁸

The narratives of Mendaña, of Gallego, his second in command, and of Catoira, the chronicler of the expedition, with their full accounts of the island group discovered upon the first expedition were not given wide publicity by the Spanish authorities. They were, in fact, put away in the archives, where they remained until their publication in full in the nineteenth and twentieth centuries.⁹ Knowledge of the discovery was circulated by word of mouth, however, and, as we have seen, it found its way, probably from one of the official reports, into the López de Velasco manuscript and was recorded upon two of its maps. Ortelius located the group upon his map of America and his world map of 1587, and in 1601 Herrera caused the López de Velasco maps to be engraved and printed in his *Descripcion de las Indias Occidentales*. In

⁸ The narrative of Mendaña's second voyage is part of the story of Quiros, who accompanied the expedition of 1595 as pilot. Two long accounts of the voyage by Quiros himself are found in Markham, *Quiros*, Volume I, Sections I and II, pp. 3-157. A summary of the two centuries of search for the lost Solomons is found in the Introduction, pp. lxvi-lxxvi, of the work of Lord Amherst of Hackney cited in Note 6. See also Charles Pierre Claret de Fleurieu, *Découvertes des François en 1768 & 1769, dans le sud-est de la Nouvelle Guinée*, Paris, 1790.

⁹ See Lord Amherst of Hackney, work cited in Note 6, above. Also bibliographical note in Wagner, *Spanish Voyages*, p. 353.

1613, many years after the second and fruitless expedition of Mendaña, the story of the discovery was told at some length by Figueroa in his *Hechos de Don Garcia Hurtado de Mendoza*.¹⁰ The failure of Mendaña to reach his islands in 1595 discouraged further attempts to exploit them, especially as the interest of Spain in Pacific exploration slowly faded after the voyage of Quiros in 1605. Though the Solomons continued to be shown upon the maps of that area, there is no record of a visit to them for nearly two centuries after their discovery, and it was not long before their very existence began to be questioned. In the later eighteenth century, however, when the English and French were making their great Pacific voyages, interest in finding them revived. About the year 1742 the French geographer, Bellin, suggested that on his second voyage Mendaña had sighted one of his own islands without recognizing it.¹¹ Byron, in 1765, looked for the islands without success.¹² In 1767 Carteret sighted three of the islands, but even though finding the Solomons was one of the purposes of his voyage he failed to identify these as part of the group he sought.¹³ Bougainville in 1768 sailed between Santa Ysabel and Choiseul, the second of which he named, but he could not believe these were part of the Solomons group.¹⁴ In 1769, Surville an-

¹⁰ J.C.B. Catalogue (1919), Vol. II, Part I, p. 100.

¹¹ J. N. Bellin, *Observations sur la Construction de la Carte des Mers comprises entre l'Asie & l'Amérique*, [Paris, c. 1742], pp. 17-19. Bellin could easily have been correct in his statement, though as a matter of fact he was attempting to prove that Santa Cruz, which Mendaña discovered in his second voyage, was no other than the Guadalcanal of the first. Actually, though of relatively the same latitude, the two islands are separated from each other by several degrees of longitude.

¹² *A Voyage round the World in His Majesty's Ship the Dolphin Commanded by the Honourable Commodore Byron . . . By an Officer on Board the said Ship*, London, 1767. The author says (pp. 134-135): "On the twenty-eighth of June, we had fresh breezes, with heavy squalls of rain, and now giving up all hopes of seeing Solomon's Islands, which we had expected to visit; and should certainly have found had there been any such islands, in the latitude in which they are placed in our maps, we altered our course . . ." In a footnote, the author adds: "Though the Spaniards have at different times sent several persons in search of these islands, it was always without success: which must probably proceed either from the uncertainty of the latitude in which they are said to be found; or the whole being a fiction."

¹³ Fleuriu, pp. 60-68, 201-204.

¹⁴ *Idem*, pp. 80-93, 205-207.

chored in a harbor of Santa Ysabel and touched at others of the group, which he named the Islands of the Arsacides, but departed without associating them with the lost Solomons.¹⁵ In 1781 Maurelle sighted Candelaria Shoals,¹⁶ and in 1788, Shortland coasted along the southern coast of Guadalcanal and San Christóval, and, under the impression that he had made a new discovery, named the group New Georgia.¹⁷

In the map which accompanied Bougainville's *Voyage autour du Monde* of 1771 (No. 100), is shown on the equator at 180° east of Paris a small group of islands entitled "Isles Salomon dont l'existence et la position sont douteuse," and this despite the fact that the explorer himself had passed between two of the islands and given a name to one of them. The largest and westernmost of the group was later to be given the name of Bougainville himself. Upon the 1775 edition of John Green's extensive *Chart of North and South America* (No. 95, note) a group of islands is labelled "Imaginary Isles of Solomon." Across this group run the tracks of Mendaña's second voyage, and the voyages of Byron and Carteret. An interesting small map, *Carte réduite des Découvertes des François, en 1768 et 1769, dans le Sud-Est de la Nouvelle Guinée* . . . (No. 103) shows Bougainville's course between Santa Ysabel and Choiseul, as well as Surville's track north of Santa Ysabel, called by him "Terre des Arsacides." (Plate XXI.)

The volume which the last-described map illustrates, the Comte de Fleurieu's *Découvertes des François, en 1768 & 1769*, Paris, 1790, summarized the history of the discovery of the Solomons, their loss, and the long search made for them by navigators. As an appendix it contained an *Extrait d'un Mémoire sur l'Existence et la Position des Îles de Salomon, Présenté à l'Académie Royale des Sciences, le 9 Janvier 1781. Par M. Buache*. The problem had been removed from the sea to the land, from the pilot house to the study. Buache

¹⁵ *Idem*, pp. 93-154, 216-231.

¹⁶ *Idem*, pp. 169-173.

¹⁷ *Idem*, pp. 174-199, 205-207. Lord Amherst of Hackney (work cited in Note 6), p. lxxv.

summarized and analyzed the evidence of all the known and reliable maps and narratives and calculated the position at which the lost Solomons must be presumed to lie, saying in effect that the islands discovered in 1768 by Bougainville and in 1769 by Surville were no other than the group called the Solomons which Mendaña had explored in 1568. When La Pérouse was sent forth in 1785 he was instructed to search out the group in the area defined by Buache; with him went an early version (No. 103*n*) of the chart of voyages southeast of New Guinea referred to in the preceding paragraph. After a notable voyage around Cape Horn and a scouring of the shores and island groups of the Pacific, that unfortunate explorer reached Botany Bay in 1788. From the day of his departure thence to prosecute his search for the Solomons, he was never seen again. Five years later in 1793 d'Entrecasteaux, searching for La Pérouse, found and identified the Solomons group.¹⁸ Those islands were restored to their place upon the maps but never resumed their distinction in men's minds as the symbol of illimitable wealth. Surely the editors of the Hakluyt Society book, *The Discovery of the Solomon Islands*, express the matter well when in speaking of this strange episode they write: "And this, although the group includes eight large islands stretched like a net across the course of navigators, in an almost unbroken line for six hundred miles! There is surely nothing in the history of maritime discovery so strange as the story of how the Isles of Solomon were discovered, lost, and found again."¹⁹

¹⁸ J.J.H. de Labillardière, *Relation du Voyage à la Recherche de La Pérouse*, Paris, 1799, 2 vols., II, p. 271, says: "La reconnoissance que nous venions de faire des terres des Arsacides ne nous laissa aucun doute qu'elles ne fussent l'archipel de Salomon, découvert par Mendana, comme le citoyen Fleurieu l'avoit présumé avec tant de fondement dans son excellent ouvrage sur les découvertes des François."

¹⁹ Lord Amherst of Hackney (work cited in Note 6, above), p. i.

VIII. THE DUTCH EXPLORATIONS AND THE
MAPPING OF AUSTRALIA

THE sudden intrusion of the Dutch into the Far East in the last decade of the sixteenth century has been given a variety of explanations by writers in search of political and economic motivation. It was a combination of events and conditions, however, rather than any single cause, which brought into being the establishment we know as the Dutch East Indies, one of the greatest of colonial empires.¹

The annexation of Portugal by Spain in 1580 meant, among other things, the decay of Portuguese initiative and an increase of weakness in Portuguese colonial administration, always a difficult task because of the great distances between Lisbon and Goa or Malacca. In this last quarter of the century the independence of the Netherlands from Spain was achieved, and a new-born Dutch nationalism became one of the sources of energy in the maritime development upon which the Low Countries now entered. In this period also Dutch ships were trading on the coast of Africa and in Brazil, and efforts were being made to find the way to Asia by the Arctic route, involving the discovery of a Northeast Passage across the top of Europe and Asia. In 1588 occurred the defeat of the Spanish Armada. The Dutch were not slow to perceive that as one consequence of the English victory an era was approaching in which Spain and Portugal might be met in open competition on distant seas. Stimulated by these events the Low Country merchants were already making plans for opening a direct route from Amsterdam to the East Indies when in 1594 a decree of Philip II closed the port of Lisbon to the ships of Holland, thus cutting off Dutch access to the spices, silks, and cottons which formed the staples of their trade with the Iberian peninsula. Two years later Dutch sailors and merchants were at Bantam in

¹ Bernard H. M. Vlekke, *Nusantara: A History of the East Indian Archipelago*. Cambridge, 1943, Chapter V.

Java, laying tentatively, and with extraordinary clumsiness, the first stones in the foundation of an empire.

The Books and Maps of Linschoten

Into this world of commercial and maritime activity stepped one day in 1592 a young Hollander, Jan Huygen van Linschoten, returned after an absence from Europe of nine years, four of them spent in travelling to and from the East, five spent in India, whither he had gone in the train of the Portuguese Archbishop of Goa. In that period he had made an admirable employment of his time so far as his future usefulness to his country was concerned, for year by year he had collected data on the lands of the East, their people, their politics, their cities, and their products. In that time he had studied the strength and the weakness of the Portuguese and Spanish in the broad world of India, China, and Malaysia. Above all, he had collected from Portuguese and Spanish mariners, and from countrymen of his own in the Portuguese service, well-ordered directions for sailing from point to point among the islands and along the Chinese mainland as far north as Japan.

There can be little doubt that after Linschoten's return to Holland he was deep in the counsels of those Amsterdam merchants who had listened to the call of the East. In 1595 appeared in that city the work entitled *Reys-gheschrift vande Navigatien der Portugaloyzers in Orienten*, in which Linschoten presented to his countrymen a sailing directory, or "pilot," for the route to India by the Cape of Good Hope and for many customary voyages along the eastern Asiatic coast, among the islands of Malaysia and beyond to the north. This was the first to be published of three books by Linschoten which made up the work issued in 1596 under the general title *Itinerario*.² Rarely has a book fitted so neatly into

² Linschoten's work and works are covered comprehensively in the publications of the Linschoten-Vereeniging, The Hague, which published as No. II in its long series the *Itinerario*, Deel I-II in 1910, and since then has devoted Nos. VIII (1914), XXXIX (1934), and XLIII (2 parts, 1939) to reprinting, carefully and fully edited,

the cultural structure of its time and place. The *Voyage ofte Schipvaert van Jan Huygen van Linschoten naer Oost ofte Portugaels Indien* and the *Beschryvinghe van de gantsche Custe van Guinea . . . ende tegen over de Cabo de S. Augustijn in Brasilien*, the second and third books of the *Itinerario* in order of publication, confirmed the Dutch merchants in the belief that the time had come for a strongly supported and persistent bid for their share in the East Indian and American trade. The *Reys-gheschrift*, appearing in 1595, actually served as a guide to the Dutch mariners on their first expedition to the East. On that account the maps accompanying the *Itinerario* must have been exciting to contemporary readers. The world map in two hemispheres by Peter Plancius will be spoken of in another connection. It is to one of the sectional maps, the *Exacta & accurata delineatio . . . in regionibus China, Cauchinchina, etc.* (No. 63) that their eyes must have turned as do ours when we open the book today, for here is a map that covers in unusual detail the eastern world as known to Spain and Portugal, and to no other countries, in the closing years of the sixteenth century. (Plate XV). Here are Java, Borneo, and the Moluccas, here are the Philippines in a degree of detail not previously shown in a printed map, and here, drawn large, is Japan and the so-called "Ilha de Corea."³ The description of the map found in the cartouche declares it to have been drawn upon the basis of the best Portuguese maps of the area. That statement is fully accepted by those investigators who compare the Linschoten chart and certain Portuguese productions with which its maker might well have been acquainted. One of these probable prototypes is an anonymous and undated Portuguese chart (No. 49a) in the Dépôt

the works of the great Dutch navigator whose name the Society bears. In 1885, The Hakluyt Society brought out in two volumes, edited by Arthur Coke Burnell and P. A. Tiele, *The Voyage of John Huyghen van Linschoten to the East Indies*, a publication which contained only the description of the East, that is, the first book from the English translation of 1598. The introduction by Tiele is informative. The bibliography of the Linschoten works is found in the Linschoten-Vereeniging publications above referred to.

³ Comment upon the delineation of Japan in this map appears in Section IX, *Japan*.

Hydrographique de la Marine, Paris. Another prototype must certainly have been the chart of the eastern Asiatic coast from Ceylon to Japan inclusive commonly found in the portolan atlases which Fernão Vaz Dourado (No. 51a) constructed in the period 1568 to 1580. The Vaz Dourado map lacks a detailed outline of the Philippine group, but Linschoten could have acquired the data for his delineation of those islands from the anonymous chart in the Dépôt Hydrographique de la Marine just mentioned. But whatever the date of that chart may be, it seems certainly to have preceded in construction the period of Linschoten's activity as a maker of maps.^{3a}

Though Linschoten's truly important map of the islands and coasts of eastern Asia was not published until it appeared as part of the complete *Itinerario* of 1596, it is not unlikely that a manuscript copy of it, or of a prototype, supplemented the *Reys-gheschrift* upon a voyage which Cornelis de Houtman led to the East in 1595. At any rate there is no doubt of the influence upon its world of this map of the seas, coasts, and islands of eastern Asia. The *Itinerario*, with its several maps and charts, its city plans and many plates, was reprinted in London in 1598, and thereafter many times in Dutch and French. It is not often that a book may be mentioned of which the influence was immediate and direct in the manner and to the degree of the Linschoten *Itinerario*.

An Empire is Founded

It was in 1595 that the first Dutch expedition to the Indies set forth. It returned in 1597, bringing to the group of Amsterdam merchants who had subsidized it encouraging reports of a possible future direct trade even though its own cargo of spices and other products of the East was disappointingly small. Wisely counselled by the government to avoid India and Malacca in order to avert trouble with the Portuguese, Cornelis de Houtman, its

^{3a} The probability that this chart, because of its Philippine content, is to be dated 1566 or later, is discussed in Section IX, *Japan*.

commander, had steered for the Strait of Sunda, separating Sumatra from Java, rather than for Malacca Strait, separating Sumatra and the Malay Peninsula.⁴ Just beyond the Strait of Sunda, on the Java coast, lay Bantam. That town, and Batavia, which they built nearby twenty years later, became the centers from which the Dutch power in the next century spread throughout Malaysia. The second expedition of 1598-1600 under Jacob Cornelisz van Neck,⁵ was followed in the year of its departure by five others sent out hugger-mugger by different groups of merchants in several Dutch cities. These were followed in the next three years by thirty-one outgoing vessels. The publication about the year 1600 of the sea chart *Tabula itineraria octo navium ductore Jacobo Cornelio van Neck* (No. 65), with its clearly marked routes, its "Exitus" and "Reditus," must have been an additional encouragement and incitement to prospective traders and explorers. The disadvantages of free enterprise carried to such an extent as this were obvious. In 1602 the United East India Company, chartered by the States General, set up monopolistic control of Dutch trade in that area where the southwest Pacific and the Indian Oceans prepare to mingle their waters. There we leave that empire aborning and pass on to the story of one of its great achievements, an achievement, by the way, from which it derived no measurable advantage.

The Mapping of Australia

The cartographical documentation of Australia is so full and proceeds by such easy and well-understood stages that it is a par-

⁴ The voyage of Houtman was definitively treated by the publication of numerous narratives in three volumes in the Linschoten-Vereeniging series, Nos. VII (1915), XXV (1926), and XXXII (1929). It was first brought to the notice of his contemporaries by Willem Lodewycksz, *D'Eerste Boeck: Historie van Indien*, Amsterdam, 1598.

⁵ For Van Neck's voyage of 1598-1600, see *Het tweede Boeck, Journael oft Dagh-register . . . vande reyse gedaen . . . onder 't beleydt vanden Admiraal Iacob Cornelisz Neck, ende Wybrant van Warwijck . . .* Middleburg, 1601. See J.C.B. Catalogue (1919), Vol. II, Part I, p. 12. A comprehensive collection of documents and narratives pertaining to this voyage began publication in 1938 by the Linschoten-Vereeniging when volume I of the work was published as No. XLII of the series.

ticular pleasure to examine several of the maps which show its progress. The enormous coast line of that country was explored piecemeal by the Dutch, now familiarizing themselves with the vast area east of their Javanese station, and appeared upon the maps of consecutive date in isolated sections. These were joined together and the Australian coast line given virtual continuity, except for the east coast, by Abel Tasman in his two voyages of the period 1642-1644. For clarity of statement it seems advisable to give here a brief relation of the more important voyages of the Dutch to the Australian coast in the period 1606-1644.

It was in September and October, 1606, that Torres passed through the strait south of New Guinea and obtained his unexpected and not fully appreciated view of the continent we know as Australia. Slightly earlier in that year Willem Jansz, commanding the Dutch yacht *Duyfken*, was carrying on an exploration of the southwest coast of New Guinea. Following what he thought was a continuous shoreline he turned southward. The western entrance of Torres Strait was thought by him to be merely a broad bay indenting the New Guinea coast. Before turning back he extended his exploration southward to a point on the Cape York peninsula between thirteen and fourteen degrees south latitude.⁶

Ten years after the *Duyfken* voyage, in October, 1616, Dirck Hartog, in the ship *Eendracht*, outward bound from Holland to Bantam, explored the west coast of Australia in the neighborhood of 25° south latitude. A considerable area of coast in that neighborhood was afterwards called on the maps "t Landt van d' Eendracht," and Hartog's name was given to one of its natural features. In 1619 an expedition sent out from Java by a Dutch official, Jan Edel, made further observations of the west coast to

⁶ For the data about the *Duyfken* and other ships and voyages mentioned in the ensuing outline of the early Dutch voyages to the Australian coasts, see R. H. Major, *Early Voyages to Terra Australis, now called Australia*, (The Hakluyt Society), London, 1859, Introduction, pp. lxxvi et seq. but especially the instructions to Tasman in 1644, pp. 42-46. See also text portions of Muller, *Remarkable Maps*, II-III. *The Geography of Australia*, Amsterdam, 1895.

the south of Eendracht Landt and gave to a long stretch of it the name Edels Landt. In 1622 the ship *Leeuwin* rounded the southwest corner and gave its name to that section of the island continent. In 1623 an expedition under Jan Carstensz retraced the route of the *Duyfken* and made a fuller record of the Gulf of Carpentaria and the Cape York peninsula. In 1627 the outward bound ship *Gulde Zeepaard*, of which one Pieter Nuyts was supercargo or chief merchant, discovered by chance the southern coast of the continent and sailed along something like a thousand miles of its shore line. In 1628 a homeward bound ship commanded by Gerrit Fredericsz De Wit coasted two hundred miles of the northwest coast in the latitude 21° south, fixing upon that area the name De Wit Landt. In 1642 the Dutch governor Antonio Van Diemen sent Abel Tasman on a voyage of exploration which resulted in the discovery of the islands we call today Tasmania and New Zealand. Tasman thought New Zealand was part of the Terra Australis Incognita. In 1644 on a second voyage he coasted the shores of the Gulf of Carpentaria, the northwest coast of Australia, and the west coast as far south as 22° south latitude, thus establishing the continuity of that great stretch of coast and filling in the gaps previously shown in it upon the maps.

The earliest printed map to show the results of any of these voyages was a sea chart, the *Caert van't Landt van d'Eendracht* (No. 70), published by Hessel Gerritsz in 1627, displaying the stretch of west coast visited by the *Eendracht* in 1616 and by the Edel and *Leeuwin* expeditions. The single known copy of that chart, the foundation of Australian cartography, is in the Rijks Archief at The Hague. It is an important document as much because of its legends as because of its configurations.

It has been said, and generally accepted as true, that the earliest record of the west coast voyages upon a general map was in the world map by Philip Eckebrecht, dated 1630, sometimes found in Kepler's *Tabulae Rudolphinae* (No. 80), the first edition of which is usually supposed to have been published in 1627. It is

worth while to mention this map only to remove the misapprehension concerning it. The bibliography of Kepler's book is confused and confusing. We need not go into that beyond saying that the *Bibliographia Kepleriana* of Max Caspar records two issues of the book, without change of date or imprint, later than the original publication of 1627, and goes on to show that the world map dated 1630, which accompanies one of these issues must have been printed in the form in which it is now known at a time considerably later than that year. Its dedication to Leopold I, naming him Emperor of the Holy Roman Empire, makes it certain that all copies of the map in the state in which it is known to us must have been published after the year 1658 when that prince assumed the imperial crown. In all probability the map was drawn in 1630, but for some reason its publication at that time was deferred. No copy of it has been seen of earlier date than those of 1658 or afterwards, bearing the imperial dedication. Long before that year other maps had been published showing a fuller picture of Australia than the Eckebrecht map could boast, thus rendering it of little importance in the history of Australian cartography.

Actually the first appearance upon a printed general map of the explorations of the Dutch on the Australian coast was a delineation of some of their discoveries on the Mercator-Hondius hemispheres of 1630 (Plate XVI), found in the *Atlas ou Représentation du Monde universel* of 1633 (No. 71). The eastern hemisphere in that map, so far as Australia is concerned, bridges the gap between the imaginary geography of the Terra Australis concept and the beginning of knowledge of the true Australia as reported by the Dutch explorers. On this map are found the outlines of the old Terra Australis Incognita with the long cape of "Beach prov." jutting northward to a point just south of Java.⁷

⁷The province of Lochac described by Marco Polo was probably the Malay Peninsula. This word Lochac or Lucach appeared in the Basle, 1532, edition of Polo as "Boeach." As "Beach" it was taken hold of by Gerhard Mercator and in his nautical chart of 1569 applied to the north-pointing cape south of Java, projecting from a vast Terra Australis. This misinterpreted name form, improperly located, be-

But the days of Terra Australis were almost numbered. Far to the east of "Beach" on the Mercator-Hondius hemisphere is to be seen the shoreline of that east coast of the Gulf of Carpentaria recorded by the *Duyfken* in 1606, and, more extensively, by Jan Carstensz in 1623, bearing the place names conferred upon its natural features in the course of the later voyage. The outlines of this coast and its nomenclature can be traced to no earlier printed map than the Mercator-Hondius hemisphere of 1630, but there exists in the Rijks Archief at the Hague a manuscript chart (No. 69) by Arent Martensz de Leeuw, chief pilot of the Carstensz expedition. From this chart or from a prototype of it Henricus Hondius may well have derived both the general and the specific information of his delineation.

The next step in the cartography of Australia is a map which shows the Gulf of Carpentaria explorations and, far west of them in the place where the province of Beach used to be located, a corner of land with the name "'T Landt van d'Eendracht" as well as evidence in the form of a legend of the visit of De Wit to that part of the continent. This was the beautiful *India quae orientalis dicitur* (No. 72) of Joan Blaeu, first published in 1640. (Plate XVII.) In the Jansson *Novus Atlas* of 1652-1658, on a map entitled *Mar di India* (No. 79), are likewise shown these features and with them an extension of the coast southward and eastward to include the stretches of shore explored by the Edel expedition, the *Leeuwin*, and the ship of Pieter Nuyts. Finally, there comes, drawing together all these scattered explorations and delineating them in an unbroken coast line, save for the eastern coast, the clear and beautifully drawn map (No. 82) accompanying *La Terre*

came a prominent feature of sixteenth- and seventeenth-century maps. See Major (work cited in Note 6 above, p. xvii), where Beach is identified with Cambodia, and N. M. Penzer, *The most noble and famous Travels of Marco Polo*, London, 1929, p. lvii, who asserts that the word was meant to designate the Malay Peninsula. The persistence of belief in a land mass in the area of the maps occupied by Beach may be accounted for in a measure by the circumstance that actually a great land mass did lie in that area, and that this circumstance must have been known for centuries to the Chinese and Malaysian traders and mariners.

Australe decouverte par le Capitaine Pelsart in Thévenot's *Relations de divers Voyages curieux*, Paris, 1663. (Plate XVIII.)

It is not to be supposed that the display of the four maps last named, none of them of the greatest rarity, tells the whole story. It is clear enough that an important element in the delineation upon them of the Carpentaria region traces to the manuscript chart of de Leeuw, Carstensen's pilot, preserved in the Rijks Archief, and that Blaeu and Jansson must have known, directly or indirectly, this chart and the printed Hessel Gerritsz chart of 1627, already mentioned as first setting forth the west coast discoveries. And it is equally clear that the Thévenot map is not entitled to all the honor once claimed for it of being the first to join the broken stretches of coast line and to show the Tasman discoveries. That map traces, it seems, to the great Blaeu map of 1659, the *Archipelagus Orientalis sive Asiaticus* (No. 81). Even before that time the Dutch voyages had been consolidated cartographically in the Hugo Allardt *India quae Orientalis Dicitur* (No. 78) of 1652, a huge work of cartography of which the only recorded copies are in the Rijks Archief at The Hague and The British Museum. But despite the priority of these large maps and of the Blaeu Globe (No. 75) of 1647-1656, and their greater degree of nearness to the sources of information, it was probably the Thévenot map rather than its prototypes which brought to the world at large the first sound idea of the shape and location of the new fifth continent disclosed by the Dutch explorations.

The Australian explorations of those early Dutch mariners are evidence of a virility which ultimately gave them great possessions in the East Indies. Strangely, it did not give them a foothold upon the Australian continent, the coast of which they were the first to explore. This condition, however, seems to have been a matter of their own choice rather than the result of national rivalries. In his *Essay upon Ancient and Modern Learning*, composed about the year 1688, Sir William Temple, long resident in Holland as the representative of Charles II, wrote these words:

"... a continent has been long since found out within fifteen degrees to the south, about the length of Java, which is marked by the name of New Holland in the maps . . . And I have heard it said among the Dutch, that their East India Company have long since forbidden, and under the greatest penalties, any further attempts of discovering that continent, having already more trade in those parts than they can turn to account, and fearing some more populous nation of Europe might make great establishments of trade in some of those unknown regions, which might ruin or impair what they have already in the Indies."⁸ Sumatra, Java, and the Moluccas, all of which the Dutch occupied in the late sixteenth and early seventeenth centuries, were easier to reach and administer, and their wealth, unlike the gold of Australia, yet to be discovered, grew upon trees rather than hid itself in the ground. It was almost as a side issue to their East Indian expeditions and settlements that they established in large part the shape and size of Australia and discovered the islands of Tasmania and New Zealand.

⁸ Major (work cited in Note 6 above), pp. vi-vii. See *The Works* of Sir William Temple, London, 1720, 2 vols., I, pp. 163-164. For the dating of this essay, see H. E. Woodbridge, *Sir William Temple*, New York, 1940, p. 222, where it is said also that the essay first appeared in print in Temple's *Miscellanea, Part II*, London, 1690.

IX. JAPAN, THE SHUTTLECOCK OF THE CARTOGRAPHERS

THE island kingdom of Japan first became known to Europeans through Marco Polo's narrative of 1298. In that work the Venetian traveller told his world that some fifteen hundred miles off the coast of China lay the rich island of Cipangu, a large and well-defended kingdom which not long before had successfully resisted the attempt at conquest made upon it by the Grand Khan.¹ In other connections we have read of the acceptance by certain mapmakers of the Polean addition to geographical knowledge. The maker of the Catalan Atlas, the mapmaker who incised upon a copper disc the wheel map of the first half of the fifteenth century in the Stefano Borgia Museum at Velletri, the maker of the anonymous Genoese map of 1457, and Martellus Germanus in 1489 or 1492 all enriched their maps to a greater or less degree by the addition of the lands seen and described by Marco Polo. None of these, as it happened, delineated or specifically named Japan upon his map, but there were others of the same general period who did both these things. The earliest of them, to my knowledge, was Fra Mauro, the Camaldolensian monk, whose great circular map of 1459 shows, crowded into the ocean stream to the east of China, the islands of "Giava" and "Ziripagi."² If, as believed, Fra Mauro's map is based upon a mural of the thirteenth or fourteenth century in the palace of the Doges at Venice,³ it may be that delineations of Japan were of earlier occurrence than that upon the map of 1459, but there seems to remain no evidence that this was the case. It is first shown with an attempt at correct location according to the Polean description up-

¹ N. M. Penzer, *The most noble and famous Travels of Marco Polo*, The Argonaut Press, London, 1929, Chapter 106, pp. 99-101. Penzer's edition is made use of here because of its introductory account of the Polo texts and the state of present-day Polo studies.

² The form of the name on the Fra Mauro map is difficult to make out on the photographic reproductions examined. It has been read both as Zimpagu and Ziripagi.

³ Nordenskiöld, *Periplus*, pp. 62, 140-141.

on the globe which Martin Behaim constructed at Nuremberg in 1492. There at some twenty-three degrees from the Asiatic coast lies the large and definitely named island of Cipangu.

The statement of the distance of Cipangu from the coast given by Polo and recorded graphically by Behaim was, as we know, very much too large, but a century was to pass after Behaim's globe was made before certainty began to be displayed by cartographers as to the island's position relative to the coast of continental Asia. As related in an earlier section Marco Polo's misstatement of its offshore distance was another of those errors through which geographical knowledge has been enlarged, for Columbus not only accepted the Polean estimate of Japan's distance from Asia but by some very wishful arithmetical thinking convinced himself that the island lay only some 2,400 miles westward of the Canaries. "In other words," Samuel Morison writes, "his calculations placed Japan about on the meridian of the Anegada Passage, Virgin Islands." There is no doubt that when Columbus returned from putting his theories to the test he thought he had found in Hispaniola not an outlying island of a new world, but Polo's island of Cipangu.⁴

Japan now became the shuttlecock of the cartographers. In the great Canerio chart of the world of 1502, the large island "Cingirina" is given position in relatively correct latitude some six hundred and fifty miles off the coast of Asia. The Contarini map of 1506, showing no continental land north of South America, locates the island "Zinpangu" in the great ocean space between Europe and Asia in the general latitude of the West Indies and considerably closer to Cuba than to China. Waldseemüller followed Behaim and placed it upon his map of 1507 some twenty degrees off the Asiatic coast, though in his inset western hemisphere map he moved it much farther eastward, locating it approximately in mid-Pacific between North America and Asia. In his map of 1507 or 1508 Joannes Ruysch adopted the Columbian

⁴ S. E. Morison, *Admiral of the Ocean Sea*, Vol. I, p. 90, et passim.

misconception and asserted in a long legend that Marco Polo's island of Cipangu was not there delineated because the voyages of the Spaniards had identified it with Hispaniola. The maker of the Lenox Globe of about 1510 made it an American island lying just off the coast of Central America. In the world map of Bernardus Sylvanus in the Ptolemy of Venice, 1511 (No. 32), the confusion introduced by Columbus failed to affect the cartographer's judgment, for there "Zampagu. Ins" was shown in the same latitude as Hispaniola but about sixty degrees to the west of it, clearly intended as an offshore island of Asia rather than of America. The makers of the great portolanos—the Cantino, 1502, the Juan de la Cosa, 1500, the King-Hamy-Huntington, 1502, and the Ribero, 1529—made no effort to locate an island concerning which they lacked first-hand information from European mariners. In the Mercator cordiform map of 1538 it is shown as a small island about halfway between Asia and America.

Up to this period in cartographical history the location of Japan upon the maps could only be conjectured, for no European was able to say from personal knowledge what were its latitude and longitude and what was its position relative to the Chinese coast. The circumstances under which it was first visited by a European are themselves in doubt. That distinction lies between Fernão Mendes Pinto, Portuguese adventurer and, later, lay brother in the Society of Jesus, and three storm-driven Portuguese sailors who jumped ship in Siam and set out for China in a junk. Both these accidental discoveries occurred in the year 1542.⁵ In 1549 St. Francis Xavier began there his celebrated mission.⁶

⁵ The voyage of Fernão Mendes Pinto is found in his often reprinted book *Peregrinação*, first published in 1614 (copy in the Library of Congress). The adventure of the sailors is recorded in Antonio Galvano, *The Discoveries of the World*, The Hakluyt Society, London, 1862, pp. 229-230, the Portuguese text of which was reprinted from the copy of the original Galvano *Tratado* of 1563 in The John Carter Brown Library.

⁶ For the mission of St. Francis Xavier, see Robert Streit, *Bibliotheca Missionum*, Münster, 1916-1934, 8 vols., IV, *Asiatische Missionsliteratur*, 1245-1599, Nos. 651, 669, 670, 671, and 850. See also J.C.B. Catalogue (1919), Vol. I, Part I, p. 166, for *Copia de alcune Littere del Padre Maestro Francesco Xavier & altri Padri della*

But despite these European associations many years went by before the correct location of the islands and a correct portrayal of their shape began to find their way into the maps. In the Gastaldi map of 1546, "Cimpaga" is shown as an island far off the Asiatic coast, while in the Zaltieri map of 1566 it appears again in mid-ocean with the designation "Giapan." And so we might go on, naming many more maps of the second half of the century in which Japan occupied a position close to Asia, in mid-ocean, or close to America, but there seems no profit in further demonstration of the fact that the cartographers of the time were still uncertain of its location. Even as late as 1590 it is shown in the northern hemisphere of Cornelis de Jode (No. 60) as a single island of a rough rectangular outline blocking the Strait of Anian and placed off the California coast about halfway to the Asiatic shore. In the same atlas on the map entitled *Asia, parium Orbis maxima*, De Jode places the island with approximate correctness close to the Asiatic coast and between 30° and 40° north latitude.

Japan on the Portuguese and Spanish Maps

It was inevitable that the Portuguese influence should be strongly felt in the cartographical description of Japan. There is first of all to be considered the anonymous Portuguese chart in the Dépôt Hydrographique de la Marine, Paris, which formerly was accepted as proceeding from about the year 1553 and is reproduced with that attributed date by Count Teleki in his study of the mapping of Japan.⁷ Later historians, however, have asserted that the knowledge of the Philippines displayed by its maker is evidence of its construction having taken place sometime

Compagnia de Iesu del Iapon, Rome, 1552, which forms a continuation of *Avisi particolari delle Indie di Portugallo*. See the same part of the J.C.B. Catalogue, pp. 173-174, for the *Nuovi Avisi*, Rome, 1553, and p. 203 for *Diversi Avisi*, 1559.

⁷ Paul, Graf Teleki, *Atlas zur Geschichte der Kartographie der Japanischen Inseln*, Budapest, 1909, Plate III. This is the map which HARRISSE, *Découverte et Évolution cartographique de Terre-Neuve*, p. 233, calls "faute de mieux la Carte portugaise du Dépôt."

after the year 1566, when the geography of the islands became known through the exploration and settlement of them by the Legaspi expedition.⁸ The question of date remains undecided. Upon this chart the Japanese islands are located between thirty and forty degrees north latitude and in approximately correct distance from the Asiatic coast. With it, or with whatever prototype it may have had, begins the error which in many maps of the ensuing century made the longer axis of the Japanese group run east and west instead of northeast and southwest. The shape of the islands here set forth, incorrect though it was, established a cartographical type which endured for nearly a century. In this portrayal, illustrated in the Linschoten map of 1596 (Plate XV) the islands of Hondu and Kiusiu form a crescent of which the southward-pointing arms create a gulf wherein lies the island of Shikoku. Sometimes described as the turtle shape, this characteristic configuration had become familiar through its employment in the manuscript atlases of Fernão Vaz Dourado, beginning with that of 1568 in which is found a special map of Japan supposed to be the oldest of European origin.⁹ The earliest appearance in print of the turtle-shaped Japanese group seems to have been in the Ortelius map of 1589 entitled *Maris Pacifici*, where it is drawn with some modification of the Vaz Dourado portrayal. It is found in much closer resemblance to the Vaz Dourado map in the Linschoten of 1596, previously referred to, and in that form it continued to appear in the *Itinerario* as late as the edition of 1644.

An advance in truthfulness of delineation occurred when Ortelius procured a sectional map of Japan from Luiz Teixeira for his *Theatrum Orbis* of 1595. In this production (No. 62) we recognize a second type of cartographical representation of Japan, also of

⁸ Cortesão, *Cartografia*, Vol. I, pp. 159-161, summarizes the arguments against the acceptance of the earlier date for this chart in the Dépôt Hydrographique de la Marine, Paris.

⁹ The work of Vaz Dourado is fully discussed in Cortesão, *Cartografia*, Vol. II, Chapter VII, pp. 7-104. See also Wagner, *Cartography*, Vol. I, pp. 60-65. His map of Japan is discussed by Cortesão, Vol. II, pp. 32, 38-41.

Portuguese origin. The Teixeira map, constructed as early as 1592, was like those of the Vaz Dourado type in that the longer axis of the group ran east and west. It abandoned the turtle-shape delineation, however, for one of somewhat greater correctness in which the eastern extremity of the island of Hondu turns northward instead of southward.¹⁰ In this map Korea lies to the westward of the Japanese group, completely detached from the mainland of Asia and bearing a legend which describes it as "Corea Insula." Opinion as to the insularity or peninsularity of Korea was at that time as unsettled as it was with regard to Lower California on the other shore of the Pacific.

Again we turn to the López de Velasco *Demarcacion*¹¹ of about 1575 for an intelligent deduction from evidence by that time accumulated relating to the position of the Japanese group. In the text of that work we read that from the accounts of Portuguese missionaries, the author had fixed upon 30° north latitude and 150 leagues from the coast of China as the position of Japan. Upon the universal map of the Indies (No. 55) in the López de Velasco manuscript (Plate XII) this information is translated into the delineation of a narrow, strung-out archipelago, running in a general north and south direction parallel and close to a Chinese coast from which Korea, either as peninsula or island, is lacking. So far as correctness of the group's axis was concerned, this map was greatly in advance of its time. In the *Yndias del Poniente* map (Plate XIII) found in this same manuscript appears south of the Japanese group a chain of small islands called "Lequio mayor" and "Lequio menor" extending in a southwesterly direction towards the coast of China. This was an early appearance of the Lequeyo, Riu-Kiu, Lieou Kieou, or Lu-Chu chain which sweeps southwest from the Japanese group towards Formosa, setting a division between the East China Sea and the Pacific. An

¹⁰ Cortesão, *Cartografia*, Vol. II, pp. 265-276, treats the work of Luiz Teixeira, and discusses the map of Japan specifically on pp. 266-267.

¹¹ See Section V, Note 14, for a description of this work.

interesting special map of this group was published by Buache in 1754 with the title *Carte du Royaume et des Isles de Lieou-Kieou Réduite d'après les Cartes Manuscrites que le R. P. Gaubil a dressées en Chine le 6 Novembre 1752*.¹²

But Japan, the shuttlecock, was about to come to rest. In the hemispheres of Peter Plancius (No. 61), of 1594, and in those hemispheres as reëngraved in 1596 and published by Joan Baptista Vrient (No. 61, note) we find for the first time on a printed map the Japanese group correctly located between 30° and 40° north latitude, about two degrees from the coast of Korea, here delineated as a peninsula. The source of the Plancius delineation seems certainly to have been the Luiz Teixeira map, but as the Plancius map is dated 1594 and the Teixeira map was not published until 1595 it must be that Plancius knew the Portuguese map in manuscript before it was put into print by Ortelius. It has previously been said that this map was constructed about 1592.^{12a} The interpretation of data recorded in the Plancius map must have seemed sound to contemporary cartographers. The maker of the Wright-Molyneux map in the Hakluyt of 1598-1600, for example, has set forth the Japanese group in similar configuration to that of Plancius and in similar relationship to the Asiatic coast. The Plancius and Wright-Molyneux maps were among the best known and most widely circulated of the period. After their publication there was no real excuse for extensive error in the location by cartographers of the Japanese islands.

Mythical Islands and Coasts of the North Pacific

Hardly had Japan been correctly located upon the maps when curiosity as to the components of the group began to be expressed by voyagers and cartographers. For nearly two centuries thereafter, however, a state of confusion existed as to the distinction between the northern island of the group and the neighboring

¹² Found in Buache, *Considerations*, 1753. Full title in note 8, Section X.

^{12a} Cortesão, *Cartografia*, Vol. II, p. 266.

Asiatic mainland with its unexplored Kamchatkan peninsula. A number of circumstances combined to bring about this condition of uncertainty. As early as 1565 it began to be said that north of the main island of the group lay an island called "Jesso."¹³ Today we identify this island without hesitation as the important Japanese island of Yezo, but for a long time its position and nature were the standing enigma of the geographers, who gave the name indiscriminately to an island, to the peninsula of Kamchatka, to the mainland north of Kamchatka, and, as we shall see, to an east-running coast which existed only in the confusion of their thoughts. The Japanese themselves distinguished this island from the peninsula of Kamchatka, calling the one Jeso Gasima, that is, the Island Ieso, and the other, Oku Jeso, or Upper Ieso. This distinction seems first to have come to European knowledge in the map constructed by Johan Gaspar Scheuchzer (No. 90) for his publication in 1727 of Engelbert Kaempfer's *History of Japan*. In the meantime for nearly two centuries the cartographers exercised their choice of delineating Yezo now in one and now in another of the several positions and categories we have just enumerated.

A second complexity in the delineation of the Pacific arose from the myth-making tendencies of mankind. Very soon after the first return voyage by the northern route from the Philippines to Mexico it began to be rumored that certain rich islands lay in the Pacific to the east of Japan. On a voyage from Manila, or rather from Macao to Acapulco, undertaken in 1584, Francisco Gali, the commander, encouraged by the stories of his Chinese pilot, sought and claimed to have found northeast of Japan four islands of great richness in the precious metals and other esteemed products. The existence of these *Islas Armenicão*, or *Isles of the Armenian*, was testified to also by a circumstantial story of an earlier Portuguese visit to these islands in which an Armenian

¹³ Nordenskiöld, *Periplus*, p. 195.

trader of Malacca played a leading part.¹⁴ It was popularly supposed that in the general neighborhood of the Isles of the Armenian lay others of equal wealth, the Rica de Oro and the Rica de Plata. In 1586 the viceroy of New Spain, dreaming of another Peru, lying conveniently on the route from the Philippines to Mexico, sent out Pedro de Unamuno in search of the Armenian's islands with their stone-built cities and well-mannered, well-dressed, friendly, white inhabitants. Unamuno sailed to the designated area upon his chart where, at about 450 leagues east of the Philippines between 29° and 34° north latitude, the rich islands were supposed to lie, but after exploring that area for a long time concluded that neither the Armenian islands nor the Rica de Oro and the Rica de Plata had actual existence.

The Unamuno report was soon forgotten, but not the dream of wealth. In 1611 another viceroy commissioned Sebastian Vizcaino to discover and settle either the Rica de Oro or the Rica de Plata, but this merchant-mariner became involved in affairs in Japan and neglected to search for the islands. We hear no more thereafter of Spanish efforts to discover the islands, but the torch they dropped was soon to be taken up and carried by the Dutch with their customary zeal and thoroughness.¹⁵

So persistent was the rumor of the existence of the Rica de Oro and its sister island that the Dutch East India Company felt it could not afford to let the chance of finding them go by. In 1639 the Company sent out an expedition of discovery under Mathijs Quast and Abel Janszoon Tasman,¹⁶ and, not discouraged by the lack of result from this voyage, equipped and in 1643 dispatched another under the command of Maarten Gerritszoon Vries. Nat-

¹⁴ Wagner, *Spanish Voyages*, pp. 134-137.

¹⁵ Idem, Chapter VIII, *passim*, tells the story of Unamuno's exploration in the western Pacific. In Chapter XII of the same work, p. 280, is a brief account of Vizcaino's voyage.

¹⁶ Quast's journal is published in full in Teleki, work cited in Note 7, above. There is an account of the voyage also in J. E. Heeres, *Journal of Tasman*, Amsterdam, 1898.

urally enough Vries, too, was unable to report upon islands which had no existence,¹⁷ but in the course of his thorough search for them he accomplished many other things, sighting the east coast of the Japanese island of Yezo, visiting Sakhalin farther north, and sailing southward to Formosa. The Vries voyage seems to have been the most thorough exploration of the Japanese seas yet made by any European expedition, but its effect in the long run was to deepen the confusion which already existed concerning that area. Cruising northeast of Yezo, Vries passed between two of the nearer Kurile Islands by a strait which afterwards bore his name. He designated the island to the west of the strait Staten Eylandt and the one to the east Compagnies Landt. He believed that Compagnies Landt was not an island but continental land, a part of the northwest coast of America.¹⁸ There is found in the Rijks Archief at The Hague an anonymous manuscript chart of the voyage of Vries upon which these discoveries are laid down (No. 73). Here is the beginning of the confusion which was to plague mariners and cartographers for a century. Upon that chart only the curving western coast line of Compagnies Landt is shown. No indication is given of its shape or area, but the delineation implies an indefinite extension to the eastward. This imaginary feature of the northern Pacific was accepted by the professional cartographers. It first appeared upon a printed map when in 1650 Jansson constructed, upon the basis of this anonymous chart, or one very much like it, his *Nova et Accurata Iaponiae* (No. 77), in which, separating Staten Eylandt from Compagnies

¹⁷ One hears little more in literature or cartography of Rica de Oro and Rica de Plata after the Vries voyage, but evidently they were hard to forget. As late as 1753 they are named and located in the Pacific east of Japan in John Green's *Chart of North and South America*, in most features a realistic work of cartography. See Section X of the present work.

¹⁸ The earliest printed account of the Vries voyage seems to have been the *Korte beschrijvinghe van het Eylandt by de Iapanders Eso genaemt . . . inden Jare 1643. van't Schip Castricom . . .*, occupying pp. 95-104 in Brouwer, *Journal*, work cited in Section VI, Note 10. Golder, *Russian Expansion*, where a good résumé of the Quast and Vries voyages is found, p. 120 et seq., cites as the first publication in full of the Vries journal P. A. Leupe and P. F. von Siebold, *Reize van Maarten Gerritszoon Vries in 1643*, Amsterdam, 1858.

Landt, appears "Straet de Vries." The error of Vries was thus perpetuated by the highest cartographical authority of the times. That was bad enough but soon a further confusion was to find record upon the best maps of the period.

In the year 1590 a Portuguese merchant of Macao in China had made his way to Mexico by the northern route, then become the customary course in that navigation. Reaching Acapulco he was arrested by the government and his papers seized. No more than that is known today of the voyage of this João da Gama.¹⁹ But though nothing is found concerning it in Mexican or Spanish archives, it seems clear that a report of Gama's voyage, perhaps a chart of it, somehow made its way to Portugal and the custody of the government. In the year 1649 João Teixeira, royal cosmographer of Portugal, constructed a large map, most interesting in many particulars, of India and eastern Asia (No. 83). Upon the map as first constructed by Teixeira there appears at about 45° north an extension of the Asiatic continent in the form of a long coast line running eastward without interruption towards the North American shores. The accompanying legend describes this coast as land seen by Don João da Gama in the course of a voyage from China to New Spain. It is supposed that Teixeira drew that feature of his map upon the basis of a report or chart of the Gama voyage of sixty years earlier to which as royal cosmographer of Portugal he would have had access.

The Teixeira map has an interesting history. It has been said that it was first engraved and printed at Lisbon in 1649, but no copy of that place and year has been discovered. In his *Nouvelles Cartes des Decouvertes de l'Amiral de Fonte*, J. N. Delisle tell us²⁰ that a copy of the map was taken by the French from a captured Portuguese carrack and, having been brought to France, was turned over to Melchisedek Thévenot, who had it engraved for the second part of his *Relations de divers Voyages*, published in

¹⁹ Wagner, *Cartography*, Vol. I, p. 138.

²⁰ P. 45.

Paris in 1664. One assumes that the captured map was in manuscript form.

It is clear from its configurations that when Teixeira constructed his map of 1649 he had not learned of the voyage of Vries in 1643. Nor does Thévenot seem to have known of the Vries voyage when at an uncertain date after 1649 he caused to be engraved what we know as the first issue of the captured Portuguese map. Soon thereafter, however, knowledge of the Vries discoveries came to him. The new information so outmoded the northeastern portion of the Teixeira map that he changed his mind about its use for the illustration of his book and caused the whole eastern section of the map to be reengraved. In this second state, the issue found normally with the Thévenot *Relations* of 1664, the coast line of Gama Land is shown as a pricked line of indefinite contour instead of the firmly drawn coast of the original Teixeira production. In this second state also the island of Iezo, shown in the first as the northernmost island of the Japanese group, has become a peninsula from the Asiatic mainland, and eastward of it appear, unnamed, Vries's Staten Eylandt and Compagnies Landt separated by a "Straet de Vries." Compagnies Landt is shown as of indefinite extent. Here is the beginning of the confusion through which in certain later maps Compagnies Landt and Gama Land become indistinguishable. In fact, Thévenot seems in this revision of the Teixeira chart to be on the point of erasing Gama Land from the map and from his mind in favor of the land which Vries had named after the Compagnie which had sent him forth.

With all these elements of uncertainty in their minds, one is prepared for the weird results achieved by the cartographers of the next century in their delineations of the northern Pacific. Perhaps the most extravagant portrayal of the area in any of the well-known maps to be named is found in a group of four sectional charts in Dudley's *Arcano del Mare* (No. 74), first published in 1646, too soon, it seems, for the cartographer to have learned

of the voyage of Vries. Dudley's maps were sea charts intended for the use of the practical mariner, a circumstance which makes the grossness of error found in some of them all but incomprehensible. In these maps, almost identical but for a difference in size and for alterations in longitude,²¹ Japan is shown, as in the Ortelius map of 1595 and its Portuguese prototype, with its longer axis running east and west, but unlike Ortelius, or any other, Dudley carries the island from the Korean coast to points one-third or one-quarter of the way across the Pacific. North of Japan is displayed one of the longest of the world's coast lines, an unbroken reach of shore running east from the northern tip of the "island" of Korea virtually all the way across the Pacific. This is Dudley's Iezo. In one of his maps, the *Carta Terza Generale del' Asia*, the eastern extremity of Iezo is separated from California by the "Stretto di Iezo" of some three hundred leagues in width. In another of them, the *Carta particolare della parte Orientale del' Isola di Iezo*, this strait, beginning at some 5° north of Cape Mendocino on the California coast, has been narrowed to about six hundred miles. Dudley's Iezo displays many legends of a geographical nature upon its coast line, and, conveniently situated about halfway of its length, a port called Matzumai, probably a confusion arising from the existence of such a port on a small island between Hondu and the true Yezo of the Japanese group.

The map, *Mare del Sud*, found in Coronelli's atlas, the *Atlante Veneto* of 1691 (No. 84), shows the influence of the Vries voyage and, further, an ill-defined but extensive land mass in the northern Pacific bearing a legend which permits the observer a wide choice in the naming of it, that is, "Terre de Iesso, o'Ieco, yedeo, Ezzo, et Sesso Scoperta Dagli Hollandesi L'an 1643." In the same cartographer's *Asia Divisa nelle sue Parti* (second sheet), found also in his *Atlante Veneto*, this land is further designated "Terra della Compagnia." In his *Planisfero del Mondo Nuovo*,

²¹ See J.C.B. Catalogue (1919), Vol. II, Part II, p. 341, and Vol. III, p. 53.

Iesso is shown as a huge island separated from Staten Eylandt by Vries Strait and from California by the Strait of Anian. Here, obviously, Iesso has been identified in the cartographer's mind with the Compagnies Landt of Maarten Vries. An identification of another sort is observable in the Sanson hemisphere of about 1695, found in his *Atlas Nouveau* of 1696-1720, entitled *Mappemonde Géo-Hydrographique* (No. 85). In this map the "Terre de la Compagnie" shown at 45° in the eastern hemisphere becomes in the western, Gama Land, and stretches across the Pacific to the Strait of Anian. Just to make confusion more confounded this vast stretch bears the legend "Terres Inconnues ou Terres de Jesso." Still further to complicate matters the Asiatic mainland north of Kamchatka is named "Terre de Jeço." The American continent is indented north of California by a vast and imaginary Mer del l'Ouest from which the Strait of Anian runs not northward to the Arctic but provides instead a northeast passage from the Pacific to the Atlantic by way of Hudson's Bay. Sanson showed himself the most credulous and most inexact of geographers in these and many other features of this map, but it was a very handsome production and undoubtedly one of wide circulation. It must have helped considerably in the dissemination and maintenance of incorrect notions of the northern Pacific area.

The Guillaume Delisle maps of the first quarter of the century were not precisely agencies of clarification. In the Jaillot *Atlas François* of 1695-1720, Delisle shows in his map *L'Asie*, of 1700 (No. 86), the Terre de Yeco as a peninsula of the Asiatic mainland, separated from "Nippon" by an almost imperceptible water passage. In his *Carte des Indes et de la Chine* of 1705 (No. 87) Terre d'Yeco ou d'Eso is similarly drawn and beside it is a legend which reads "on ne scait si la Terre d'Yeço tient au Japon ou non." In his *Hemisphere Septentrional* of 1714 (No. 88) Terre d'Yeco, separated from the Asiatic coast by the strait called "Tessoï," joins with Nippon to form a single large island. In his hemispheres of 1720 (No. 89) Terre d'Yeco is shown as a penin-

sular projection from the Asiatic continent while from this non-existent peninsula Japan itself projects southward in peninsular form. All these different interpretations by this distinguished cartographer are found in the same atlas. Upon all of them appear the *Terre de la Compagnie*, the *Isle des États*, and, where the bounds of the map permit, an indication of Gama Land. Delisle made no bones of the fact that he was guessing in his delineations of Japan and Yezo. He admits in his *Lettre . . . sur la question, si le Japon est une Ile*, that his conjectures have no positive foundation.²² The force of bad example is a characteristic in the lives of maps as of men. In the curious Turkish book, the *Ta'rikh al-Hind al-Gharbi* of Constantinople, 1730, the world map reveals Gama Land, unnamed, running from a point northeast of Japan across the Pacific almost to the northern point of Lower California, drawn here as an island.

With the Strait of Anian still a conjectural feature of the geography of the northern Pacific, with most maps showing a land mass under one name or another stretching from Japan eastward to North America, with uncertainty as to whether Yezo was an island, a peninsula from the Asiatic coast north of Japan, or the Asiatic mainland itself, and with a great gulf indenting the north-western coast of America and providing a passage from the Pacific to the Atlantic, the state of knowledge of the northern Pacific was little more advanced in 1725 than it had been a century earlier. In our next chapter we shall read of the valorous efforts of the Russians to dispel the sense of uneasiness which affected geographers and mapmakers whenever the question of the shape, size, and position of the lands and seas of the northern Pacific entered their deliberations.

²² *Recueil de Voyages au Nord*, Vol. IV, ed. of Amsterdam, 1732, pp. 17-31. Scheuchzer's reference in his Introduction (p. 1) to Kaempfer's *History of Japan*, 3 v., Glasgow and New York, 1906, is to the third volume, p. 32, of the *Recueil*. This probably means the edition of 1715, not available to the writer for reference.

X. THE RUSSIAN DISCOVERIES

IT is not always remembered that while the North American continent was being explored by Spain, France, and England, while its boundaries to the north and west were being pushed back and its fastnesses opened to settlement, a similar process of expansion was being carried on in eastern Europe and Asia through the enterprise and ambition of Russia. There the thrust was to the north and east, its boundaries the Arctic and the Pacific Oceans. In the late sixteenth and early seventeenth centuries Russia learned a good deal about the shore line of Siberia and the north-flowing rivers which emptied into the Arctic. In the mid-seventeenth century her pioneers reached and explored the entire western shore of the Okhotsk Sea. By the closing years of that century she had reached and tentatively occupied the Pacific shore of the Kamchatkan peninsula, an eventuation which brought about in the general consciousness an enormous enlargement of the known territory of the world.¹

It was a matter of uncertainty in the minds of these far-wandering soldiers and tribute gatherers, sent by Russia to the eastern borders of her empire, as to whether or not there was an uninterrupted water passage between the river mouths they occupied on the Arctic shore and their stations on the Pacific side of the Kamchatkan peninsula. There was, indeed, a tradition, first recorded in map and book in the mid-eighteenth century by the Russian historian, Gerhard Friedrich Müller, that in 1647-1648 an expedition under Semön Iwanof Deshnev had sailed from the mouth of the Kolyma River on the Siberian Arctic shore to the mouth of the Anadyr on the Pacific side north of Kamchatka, rounding East Cape, or Deshnev Cape, as it is sometimes called,

¹ For much of the general matter of this chapter the author has placed his reliance upon F. A. Golder, *Russian Expansion on the Pacific, 1641-1850*, Cleveland, 1914; and L. Breitfuss, *Early Maps of North-Eastern Asia and of the Lands around the North Pacific*, pp. 87-99 in *Imago Mundi* III.

and passing through the strait which a century later was to be designated by the name of Vitus Bering. There have been two centuries of controversy over the question of the actuality of this voyage.² But whatever the beliefs of modern students it seems certain that Russians of a half century or more after Deshnev's time either had not heard of his voyage or flatly disbelieved in it. The very core of meaning to the first expedition of Bering in 1725-1728 was to determine whether there existed such a strait as that which Deshnev is said to have passed through. Peter the Great even wrote in his instructions to Bering that the coast running north of Kamchatka "(since its limits are unknown) seems to be a part of America."³ There was no suggestion here of a strait or of a former passage through it from north to south by a Russian or any other explorer.

Bering's First Expedition

It seems to have been by general consent that the task of northern Pacific exploration was laid upon Russia. Peter the Great is said to have accepted this task somewhat in the spirit of one who assumes a public obligation, and assumes it all the more willingly because the discovery of a water route to China would open the way to a lucrative trade for his empire. Sometime in 1724 he began planning an expedition which should determine whether Asia and America were separated by a strait and whether, if that were the case, passage of the strait would conduct one from the Pacific into the Arctic. Peter died before the expedition set forth, but the plan was carried through by his widow, the Empress Catherine,

² In his work cited above, F. A. Golder devotes Chapter III to *A Critical Examination of Deshnev's Voyage*, concluding that the fact of its occurrence is unlikely. Breitfuss, on the other hand, seems to accept its truth without reservation in his article cited in Note 1, above. The fullest early account of it is found (see Golder, *Russian Expansion*, Appendix A) in G. F. Müller, *Sammlung Russischer Geschichte*, St. Petersburg, 1758, Vol. III, pp. 7-20. Golder gives an English translation of Deshnev's own report.

³ F. A. Golder, *Bering's Voyages* (American Geographical Society, Research Series, No. 1), 2 vols., New York, 1922-1925, Vol. I, p. 11.

who in February, 1725, sent Vitus Bering overland from St. Petersburg to the Sea of Okhotsk and the Kamchatkan peninsula. Bering's journey across Russia and Siberia, his crossing of the sea of Okhotsk to the western shore of Kamchatka, his overland journey by dog sled northeast to the Pacific shore of the peninsula, required three years of arduous travel before he might even build the ship upon which his maritime exploration was to be conducted. This tremendous drama was, unhappily, to proceed to anti-climax. On July 13, 1728, the new ship, the *St. Gabriel*, set out from Kamchatka, sailed as far north in the strait as $67^{\circ} 18'$, and by September 7 was back in Kamchatka without having seen the American coast or learned beyond question whether or where the Pacific joined the Arctic. Three and a half years of laborious preparation, two months of inconclusive search! ⁴ Bering, in fact, was well convinced that he had found a way from the Pacific into the Arctic and had determined that Asia and America were separate continents, but so persistent was the question in the minds of his contemporaries that he himself suggested a second expedition, partly, it seems, to reestablish his reputation among his friends and enemies and partly to silence the doubt which had arisen in his own mind.

The Second Expedition and the Discovery of America

Bering's expedition of 1733 was planned as an elaborate scientific exploration of the lands and seas of the northern Pacific. Its commander's part in this assault upon the obscure geography of the area north of Japan was not as before to sail northward to determine the relationship between Asia and America, the Pacific and the Arctic. That field of exploration was allotted to a section of the expedition which received orders to proceed eastward along the Siberian Arctic shore around East Cape, and make its way

⁴ Golder, *Russian Expansion*, Chapter VI, but especially Golder, *Bering's Voyages*, with its documentation (Vol. I, pp. 9-20) in the form of Bering's report to the Empress.

to Kamchatka. Another section under Captain Spanberg was assigned the task of exploring the area between Kamchatka and Japan, while the third task, that laid upon Bering, was to explore southward for certain land masses frequently reported to lie northeast of Japan, and, after that, to discover America.

In our last chapter we told of the confusion among the geographers regarding the existence and location of Yezo, Compagnies Landt, and Gama Land, "whether," as Golder writes, these "were islands or continents, whether they were parts of America or of Asia, whether they were three distinct lands or one and the same."⁵ In 1731 Joseph Nicolas Delisle, the geographer, drew a map for the St. Petersburg Academy of Sciences based upon Guillaume Delisle's map of 1722, postulating the existence of these lands. The J. N. Delisle map was based also in some of its features upon Bering's map of 1730, recording the far northern discoveries of the expedition of 1728. The original Delisle manuscript is now in Paris in the archives of the Service Hydrographique de la Marine. It seems certain that it was not this original but a copy of it which the Academy gave Bering when he left St. Petersburg in 1733.⁶ It was his intention to sail southeastward from Kamchatka and either find Gama Land and the other coasts shown upon the Delisle manuscript, or else by not finding them to make possible the removal of their ghosts from the maps of the future.

That part of the expedition directly under Bering's command began its slow overland journey eastward from St. Petersburg at different times in the winter and spring of 1733. It set sail from Kamchatka eight years later in May, 1741. Bering's second in command was Alexei Chirikov, and among the several scientists and observers who accompanied the expedition was Louis Delisle de la Croyère, half brother of the geographers, Joseph Nicolas and Guillaume Delisle. As the map of J. N. Delisle showed

⁵ Golder, *Bering's Voyages*, Vol. I, p. 3.

⁶ This map is reproduced by Golder in *Bering's Voyages*, Vol. II, p. 72.

Gama Land at 47° it was decided at a council of the leaders to sail southeastward in search of it as far as 46° . Actually Bering's ship went as far south as $46^{\circ} 5'$ without sighting the lands which showed upon the map in these latitudes. The ghosts of Gama Land and Compagnies Landt were thus effectually laid so far as concerned the consideration of them as great islands or the continental land of North America. Just as more than twenty years later Captain Cook removed the mysterious Terra Australis from the maps of the South Pacific by sailing unimpeded over the area it was supposed to occupy, so, here in the north, the ships of Bering and Chirikov found deep water beneath their keels in that part of the Ocean in which by tradition lay the land first seen by João da Gama.

A further clarification of the geographical puzzles of this area was brought about through the activities of that part of the second Bering expedition assigned to the exploration of the waters and islands between Kamchatka and Japan. That subsidiary exploration was in the capable hands of Captain Spanberg, who in three voyages of 1738, 1739, and 1742 demonstrated that Staten Eylandt, or State Land, and Compagnies Landt were "two insignificant islets of the Kurile chain."⁷ Spanberg explored the shores of the Kurile Islands, and coasted the island of Yezo and the northern part of Hondu, the main island of the Japanese group. But even when Spanberg's evidence that Compagnies Landt had no being in its legendary form was added to Bering's proof that no such land as Gama Land could be discovered where it was supposed to lie, Joseph Nicolas Delisle and his associate Philippe Buache were not wholly convinced that these land masses had no existence. In the map of 1752 (No. 94) which Buache designed according to the directions of Delisle, Gama Land, an indefinite coast, still finds place, though it has been pushed southward to 45° . When some two years later, Buache published his *Considera-*

⁷ Golder, *Russian Expansion*, Chapter VIII, especially pp. 220-231, and Breitfuß, article cited in Note 1, above.

tions,⁸ a number of the maps he displayed showed that the geographers were still bemused, but in one of them, the *Carte de l'Isle de Ieso* (No. 96), dated 1754, there are the beginnings of clarification. Gama Land is shown as an island instead of an indefinite, east-running coast, or at least an island shape is given it by a dotted line. It is suggested that this land, supposed to have been seen by Gama, is the Kia-y-tao of the Chinese and Japanese. Because of this piling of Japanese and Chinese evidence upon the evidence of the João Teixeira map of 1649 (No. 83) Buache holds obstinately to his brief for the existence of Gama Land. But the real service of this map is the explanation, based upon the Scheuchzer map (No. 90) in Kaempfer's *History of Japan*, in which the confusion concerning Yezo or Ieso is clarified graphically and by legends. In Part Three, Article II, of his accompanying text Buache writes at length of the history of the mapping of Ieso, and makes clear that to the Japanese themselves Ieso-Gasima, or Ieso the Island, was their own island of Yezo, while Oku-Ieso, or Haut-Ieso, on the mainland north of the Sea of Okhotsk, was a large area, which, improperly described and located by early European reporters, might understandably have given rise to such grotesque representations of a vast northern island as that which Dudley placed upon his maps of 1646 (No. 74).

We return now to the day in 1741 when after having sailed south to $46^{\circ} 5'$ and having decided that Gama Land did not exist, Bering turned sharply to the northeast from his previously held southeast course from Kamchatka and proceeded to carry out the second part of his mission—the discovery of the western coast of North America. On July 16, 1741, he made his landfall off the coast of Alaska in the neighborhood of Mt. St. Elias, which he saw and named. Returning he coasted the southern fringe of the Aleutian Islands. He was driven ashore upon the barren island

⁸ Philippe Buache, *Considerations géographiques et physiques sur les nouvelles Découvertes au Nord de la Grande Mer* . . . Paris, 1753. The colophon of this book is dated 1754 and the "Liste des Cartes" found in some copies is dated 1755.

which today bears his name, and there died on December 8. His second in command, Alexei Chirikov, whose ship had become separated from Bering's, likewise reached the coast of Alaska. Chirikov made a safe return to Kamchatka.⁹

For the cartographical record of these voyages, we turn first to the map (No. 91) made by Bering in Moscow in 1731. Presented by the Russian government to the King of Poland, it passed as a gift from the King to the Jesuit, Jean Baptiste du Halde, for whose work on China it was engraved by J. B. B. d'Anville, and published in 1735. In 1746 the royal geographer, George Louis Le Rouge, brought out a map entitled *L'Amérique* (No. 92) in the northwest corner of which is shown a portion of the 1741 routes of Chirikov and Delisle de la Croyère to and from the American coast, the earliest cartographical record, it seems from present knowledge, of the American discoveries of the second Bering expedition.¹⁰ This map antedates by six years the publication of the Delisle-Buache map, soon to be discussed, and it resembles that map in its omission from the record of the route of Bering. There is ground for the belief that during his stay in Russia of twenty-one years J. N. Delisle sent to France through the French embassy copies of maps which passed through his hands as an employee and associate of the Academy of Science.¹¹ Doubtless intended for the information of the French government, these would have become available to Le Rouge as royal geographer.

The priority of the Le Rouge map in recording the Russian expedition of 1741 is challenged by certain legends upon the map of George Maurice Lowitz, entitled *Planiglobii Terrestris Mappa*

⁹ A full record of Bering's second voyage of discovery is found in Golder, *Bering's Voyages*, where are printed in English translation logs of the *St. Peter* and the *St. Paul*, and journals of several members of the expedition.

¹⁰ A copy of this map is in the collection of Mr. Thomas W. Streeter of Morristown, New Jersey. Mr. Streeter sent me the map for examination and called my attention to its probable priority in the display of the Chirikov route and discovery.

¹¹ Breitfuss, article cited in Note 1 above, pp. 90-92. See also Leo Bagrow, *Ivan Kirilov, Compiler of the First Russian Atlas, 1689-1737*, in: *Imago Mundi* II, pp. 78-82.

universalis (No. 93), a production which bears the date 1746 in its title, but which was not certainly published in that year. It is commonly found in the Homann atlases of 1752 and later. If we assume 1746 as its date of publication, however, we find it a map of considerable interest in the present association. It does not show the routes of either Bering or Chirikov, but along the coast of the Alaskan peninsula runs the explicit legend "Littora Americana Russica." South of the peninsula below the points marked "M. St. Elie" and "C. St. Elie" is the legend "detecta a Bering 1741," and still farther south are the words "detecta a Tschirikov 1741." As we shall see, there was full understanding by the mapmakers of Chirikov's part in the discovery of the North American coast, but here, whether the map is properly dated 1746 or 1752, is an early statement on a printed map to take into account Bering's successful completion of the American voyage.

The Delisle-Buache Maps and the Resulting Controversy

Three years after his return to France in 1747, Delisle presented to the French Academy of Sciences the map entitled *Carte des Nouvelles Découvertes au Nord de la Mer du Sud* (No. 94), the joint production of himself and Philippe Buache.^{11a} In this map Bering is shown as sailing directly from Kamchatka to Bering Isle where he died, and his part in the search for Gama Land and in the discovery of the American coast is omitted from the graphic record. Spanberg's exploration of the Kurile Islands and northern Japan is recorded but its implications are virtually ignored. The voyage of Chirikov, Bering's second in command, southward and northeastward to the American coast is, however, laid down with great fullness, and a new coast seen by Chirikov, running east and west between 50° and 55° north latitude, is drawn upon the map to increase the fog which hung over that area in the minds of ge-

^{11a} Confusion arises in speaking of this map because though presented to the Academy in April, 1750, it was almost certainly not published until 1752. In all probability it was in manuscript when presented to the Academy in 1750. See our List of Maps, No. 94, note.

ographers. Because J. N. Delisle's half brother, Louis Delisle de la Croyère, sailed with Chirikov, it has been said more than once that in this map the second in command of the expedition was played up at the expense of Vitus Bering, its leader. There is no indication of such a purpose in Delisle's memoir read before the French Academy of Sciences on April 8, 1750.¹² A more sensible view is that Delisle, a conscientious if sometimes bewildered geographer, simply had not learned of Bering's part in the expedition at the time he and Philippe Buache constructed their celebrated map.¹³

The Delisle-Buache map was sharply challenged by the Russian historian Gerhard Friedrich Müller, who in 1753 published anonymously a pamphlet entitled *Lettre d'un Officier de la Marine Russe*¹⁴ in which the significance of the voyages of Bering and Spanberg is made clear upon the basis of what they actually saw and reported, while the fantastic delineation of the North American coast given by Delisle and Buache is criticized, particularly the route of the De Fonte voyage and the vast Mer de l'Ouest which were prominent features of their map of 1752.^{14a} Replying to Müller in his *Considerations*¹⁵ of 1754, Buache clung to the possibility of the existence of Gama Land in both his text and his maps, basing his faith, as already said, upon the 1649 map of Teixeira described in the foregoing chapter, and upon evidence

¹² *Nouvelles Découvertes au Nord de la Mer du Sud. Lû dans l'Assemblée publique de l'Académie Royale des Sciences le 8 Avril 1750. par M. de l'Isle de la même Académie*, pp. 4-12 in: *Explication de la Carte des nouvelles Découvertes au Nord de la Mer du Sud; par M. de l'Isle*, Paris 1752. Translated in the Arthur Dobbs edition of the *Lettre d'un Officier*, cited in Note 14, below.

¹³ Golder, *Russian Expansion*, pp. 212-213, note 420, defends Delisle on this specific charge of belittling Bering.

¹⁴ *Lettre d'un Officier de la Marine Russe à un Seigneur de la Cour concernant la Carte des Nouvelles Découvertes*, Berlin, [1753]. A copy is in The John Carter Brown Library, where is also to be found the less rare English translation, *A Letter from a Russian Sea-Officer, to a Person of Distinction at the Court of St. Petersburg*, with notes by Arthur Dobbs, London, 1754. For attribution of authorship to Müller, see Breidfuss, article cited in Note 1, above, pp. 94-95.

^{14a} See note 11a, above.

¹⁵ See Note 8, above.

that the Chinese and Japanese located in that area a large island called Kia-y-tao. The most conclusive factor in this controversy was the publication in 1754 of Müller's map, *Nouvelle Carte des Decouvertes faites par des Vaisseaux Russes* (No. 97). Here for the first time was the full delineation of the Bering and Chirikov voyages with their destruction of the Gama Land tradition. Here, too, was an elimination from the picture of the legendary Yezo, a correct portrayal of the Kurile Islands, the delineation without the De Fonte fable of the North American coast, and a suggested outline of Alaska and the Aleutian chain. (Plate XX.) Despite defects arising from the still incomplete exploration of the area, the northern Pacific and its shores are set down upon the Müller map in such fashion as to give that production a respectable position in the history of cartography.¹⁶ In 1761 this map was reproduced by Jefferys to accompany his *Voyages from Asia to America*, translated from the third volume of Müller's *Sammlung Russischer Geschichte* of 1758. In that form it has been well known to English and American students of Pacific cartography. One point in which it is definitely superior to its prototype is the presence upon it of a legend relating to the Spanberg explorations. Müller describes Spanberg's discoveries in his *Lettre* and because of what they revealed corrects the current delineation of the area north of Japan even though he fails to record the name of the explorer upon his map.

While this controversy was going on between the Delisle-Buache faction and the Russian, or Russian-German, Müller, attention was called to the significance of the Russian discoveries by the Englishman, Bradock Mead, who, under the name of John Green, issued in 1753 *A Chart of North and South America, including the Atlantic and Pacific Oceans* (No. 95) and who in explanation of this chart published in London in 1753 a pamphlet entitled *Re-*

¹⁶ Mr. Thomas W. Streeter, of Morristown, New Jersey, sent me his copy of the very rare 1754 issue of this map for examination and for reproduction as Plate No. XX of the present work. Mr. Streeter owns also the issue of 1758.

marks in Support of the new Chart of North and South America; in Six Sheets.¹⁷ Like Delisle, Green omitted the Bering route of 1741. He was not entirely free from the tyranny of tradition in other particulars. Upon the northern Pacific section of the map appear the Rica de Oro and the Rica de Plata, the fabulous islands which some two centuries earlier had begun the confusion which he was now helping dispel. But likewise upon this map there is found a record of Spanberg's explorations and, replacing Gama Land, a legend which suggests that it was the Kurile Islands which Gama had seen and mistaken for a long-extended east-and-west-running coast. Another contribution by Green to the history of the area is his designation of the strait between Asia and America, called for some two centuries the Strait of Anian, by the name "Behring's Straits." " . . . as it owes its Discovery to the above-mentioned Captain Behring," wrote Green, "I have made no Scruple to denominate it from him."¹⁸ In the postscript to his pamphlet Green makes it clear that his imperfect knowledge of Bering's second expedition was derived from the Delisle-Buache map of 1752.

Here the question of the north Pacific remained for a good many years, that is, in the state in which it was left after the second Bering expedition. One section of that expedition, it will be remembered, had been assigned the task of determining the possibility of sailing from the river Kolyma on the Siberian shore of the Arctic to the mouth of the Anadyr on the shores of the Bering Sea. Complete failure marked that exploration, so that as Mr. Golder writes, "The same questions were asked after the second expedition as at the end of the first expedition . . ."¹⁹ In 1778, however, Captain Cook passed through Bering Strait, rounded East Cape, and sailed westward along the northern Siberian coast to North Cape. In 1823, Baron Wrangell walked along the Siberian shore from the Kolyma River to Kolyuchin Island, over-

¹⁷ Copy in The John Carter Brown Library.

¹⁸ Green, work cited in text, p. 25.

¹⁹ Golder, *Bering's Voyages*, Vol. I, p. 328.

lapping from west to east Cook's voyage from east to west²⁰ of nearly half a century earlier. Thus through the efforts of many men over a century of time was answered the question which Peter the Great had posed in 1725. It was now certain that America and Asia were separate continents and that between them lay a strait connecting the Pacific and Arctic Oceans.

A Last Word on Captain Cook

The broad outlines of the task of mapping the Pacific were completed when Cook had explored the coasts of Australia and New Zealand, disproved the existence of the Terra Australis, discovered or rediscovered the Hawaiian Islands and numerous other groups, verified the existence of a strait between Australia and New Guinea, and passed through Bering Strait from the Pacific to the Arctic. A statement of the results of his three great voyages of the period 1768-1779 is fully and graphically set forth in one of the most important of all maps, the *General Chart Exhibiting the Discoveries made by Capt^a James Cook* (No. 102) constructed by Lieutenant Henry Roberts to accompany Cook's *A Voyage to the Pacific Ocean*, London, 1784.

The voyages of Captain Cook touched the imaginations of men everywhere in the civilized world, and not least in British America where, because of them, now appeared for the first time a widespread interest in the world that lay westward of the American continents. With a brief account of the birth of that interest in what is now the United States this story of the early cartography of the Pacific draws to its conclusion.

In 1773, Dr. John Hawkesworth brought out in London three handsome quarto volumes entitled *An Account of the Voyages undertaken by the Order of his present Majesty for making Discoveries in the Southern Hemisphere*. The first dealt with the South Sea voyages of Byron, Wallis, and Carteret, and the second and third with the

²⁰ Golder, *Russian Expansion*, pp. 251-253.

first voyage round the world of Captain Cook. Announcing that he could undersell this edition of the official account of Cook's voyage, James Rivington, the New York printer, brought out in 1774 two volumes comprising the second and third volumes of Hawkesworth's *Account*. Rivington's edition of Hawkesworth was a poor publication in comparison with the handsome English quartos, and its plates are hardly to be mentioned except for the historic interest one of them possesses as the work of Paul Revere.²¹ Its single map, showing the route of the last voyage, has interest to collectors of Americana through having been "protracted" by the Swiss-American engineer Bernard Romans. It is worth observing, however, that Rivington made of this work a publication venture of extraordinary proportions for the time and place.²²

In 1783, there was published in Philadelphia by Robert Bell *An Authentic Narrative of a Voyage to the Pacific Ocean*, a book on Cook's last voyage bearing the title of William Ellis's publication on that subject of London, 1782.²³ Actually Bell's book was not a republication of the Ellis narrative but of John Rickman's *Journal of Captain Cook's Last Voyage*, London, 1781.²⁴ Bell practiced piracy on principle, but there seems no good reason for the double borrowing here perpetrated, the text of one book introduced by the title of another.

Finally there was published in Hartford, Connecticut, what was believed for a long time to be an original American contribution to the literature of the Cook explorations. John Ledyard, an Ameri-

²¹ An unsigned plate in Volume II is frequently attributed to Revere, but Mr. Clarence Brigham of the American Antiquarian Society wrote me under date of December 18, 1930, that neither in the engraver's Day Book nor elsewhere was there evidence that this plate had been done by him.

²² See P. Lee Phillips, *Notes on the Life and Work of Bernard Romans*, Deland, Florida, 1924, p. 76. L. C. Wroth in Hellmut Lehmann-Haupt, *The Book in America*, New York, 1939, pp. 50-52.

²³ Evans, *American Bibliography*, No. 17921. See Holmes, *An Introduction to the Bibliography of Captain James Cook*, No. 17, for title of original London edition.

²⁴ L. C. Wroth in "Notes for Bibliophiles," *New York Herald Tribune* "Books," February 12, 1939.

can by birth, was a member of the last Cook expedition, that of 1776-1780 in the course of which the celebrated navigator lost his life. Returning to his native Connecticut Ledyard published in 1783 what he declared was the substance of his own journal of the voyage,²⁵ and placed in the volume a map (Plate XXII) entitled *Chart shewing the Tracks of the Ships employed in Capt Cook's last Voyage to the Pacific Ocean; in the years 1776, 1777, 1778, 1779*. This and the Romans chart of the first voyage, published, as related, in New York in 1774, are the earliest maps of Cook's discoveries to be engraved in this country. It would be a satisfaction to say that the Ledyard map was an original American contribution to Pacific cartography, but it is not that. It is, on the other hand, a copy of the map which appeared in Lieutenant John Rickman's *Journal*, previously mentioned as having been published in London in 1781. As with Ledyard's map, so in a measure with his narrative, *A Journal of Captain Cook's Last Voyage*. Ledyard's *Journal* is not a completely original work, though there are many passages in it that are based upon his recollections. The foundation of the book is the journal of John Rickman.²⁶ None of this, however, was known to Ledyard's contemporaries. The book was accepted and read by them as an original narrative. It is accepted by us as an indication of the current American interest in Pacific exploration. Ledyard was an eyewitness of the events recorded in the book. Its subject matter was something that lay close to his heart. For the remainder of his life he was almost a monomaniac on the subject of getting back to the northwest coast and setting about the development of the Pacific fur trade. The story of his efforts and ultimate failure is one of the American romances of the period.

Let us look at one more map before this discussion of early Pacific cartography comes to its end. In 1798 Aaron Arrowsmith published in London his *Chart of the Pacific Ocean* (No. 104), a

²⁵ *A Journal of Captain Cook's last Voyage to the Pacific Ocean*, Hartford, 1783. Evans, *American Bibliography*, No. 17998; Holmes, work cited in note 23, above, No. 18.

²⁶ Holmes, work cited in note 23, above, No. 15.

great sailing chart in nine sheets upon which are found the coasts, the broad reaches of the great ocean, and the innumerable island groups within it discovered by Spanish, Portuguese, Dutch, Russian, English, and French explorers from Balboa and Magellan to Cook and Vancouver. Here is a notable summary of knowledge. The copy in The John Carter Brown Library is one of particular interest because it shows that summary in actual process of being enlarged. This copy belonged to the Providence mercantile house of Brown & Ives, and upon it someone has pricked in ink the courses of vessels sent out by that firm to take part in the great trade recently opened in those distant seas. Here is the notation of an island sighted by one of their ships which had not been hitherto charted. Elsewhere there are other bits of information which, passed from ship captain to owner, from owner to other ship captains, would some day find incorporation in printed charts. In this copy of the Arrowsmith map we see the process by which cartography develops through the practical necessities of merchants and mariners intent upon the ordinary business of life, intent upon getting somewhere by the shortest route with the largest avoidance of dangers.

This account of the early cartography of the Pacific is a record of events which represent one of the great exercises of the striving human spirit. The desire for fame, the love of gain, the need to see and to know, and the instinct for growth and expansion possessed by men and nations were its motivating elements. The maps these men made to memorialize their goings and comings are witnesses to the painful and dangerous ventures through which the round world was measured and its fastnesses opened to the understanding of modern man.

Appendices

KEY TO ABBREVIATIONS OF WORKS MOST FREQUENTLY CITED
IN NOTES AND LIST OF MAPS

LIST OF PRINCIPAL MAPS MENTIONED IN THE TEXT

LIST OF PLATES

KEY TO ABBREVIATIONS OF WORKS MOST
FREQUENTLY CITED IN NOTES
AND LIST OF MAPS

- Bagrow: Leo Bagrow, *A. Ortelii Catalogus Cartographorum*. (Ergänzungsheft Nr. 199 zu *Petermanns Mitteilungen*.) 2 vols. Gotha, 1928.
- Breitfuss: L. Breitfuss, "Early Maps of North-Eastern Asia and of the Lands around the North Pacific. Controversy between G. F. Müller and J. N. Delisle," pp. 87-99 in: *Imago Mundi III*, London, 1939.
- Caraci: G. Caraci, "A Little Known Atlas by Vesconte Maggiolo, 1518 [*sic* for 1511]," pp. 37-54 in: *Imago Mundi II*, London, 1937.
- Cary & Warmington: M. Cary and E. H. Warmington, *The ancient Explorers*. New York, 1929.
- Church Catalogue: *A Catalogue of Books relating to the Discovery and early History of North and South America forming a Part of the Library of E. D. Church. Compiled and annotated by George Watson Cole*. 5 vols. New York, 1907.
- Corteseão, *Cartografia*: Armando Corteseão, *Cartografia e Cartógrafos portugueses dos séculos XV e XVI*. 2 vols. Lisbon, 1935.
- De Ricci & Wilson: Seymour De Ricci and W. J. Wilson, *Census of Medieval and Renaissance Manuscripts in the United States and Canada*. 3 vols. New York, 1935-1940.
- Fischer & Wieser: Jos. Fischer and Franz von Wieser, *The Oldest Map with the Name America of the Year 1507 and the Carta Marina of the Year 1516 by M. Waldseemüller (Ilacomilus)*. Innsbruck, 1903.
- Fite & Freeman: Emerson D. Fite and Archibald Freeman, *A Book of Old Maps Delineating American History from the Earliest Days Down to the Close of the Revolutionary War*. Cambridge, 1926.
- Fleurieu: Charles Pierre Claret, comte de Fleurieu, *Découvertes des François, en 1768 & 1769, dans le sud-est de la Nouvelle Guinée*. Paris, 1790.
- Golder, *Bering's Voyages*: F. A. Golder, *Bering's Voyages. An Account of the Efforts of the Russians to Determine the Relation of Asia and America*. 2 vols. American Geographical Society Research Series No. 1. New York, 1922.

- Golder, *Russian Expansion*: F. A. Golder, *Russian Expansion on the Pacific, 1641-1850. An Account of the earliest and later Expeditions made by the Russians along the Pacific Coast of Asia and North America; including some related Expeditions to the Arctic Regions.* Cleveland, 1914.
- Harrisse, B.A.V.: Henry Harrisse, *Bibliotheca Americana Vetustissima. A Description of Works relating to America published between the Years 1492 and 1551.* New York, 1866.
- Harrisse, *Discovery*: Henry Harrisse, *The Discovery of North America.* London and Paris, 1892.
- Imago Mundi I: Imago Mundi, Jahrbuch der alten Kartographie, I.* Leo Bagrow and Hans Wertheim, editors. Berlin, 1935.
- Imago Mundi II: Imago Mundi. A periodical Review of early Cartography, II.* Edited by Leo Bagrow and Edward Lynam. London, 1937.
- Imago Mundi III: Imago Mundi. A periodical Review of early Cartography, III.* Edited by Leo Bagrow and Edward Lynam. London, 1939.
- J.C.B. Catalogue (1875): *Bibliotheca Americana. A Catalogue of Books relating to North and South America in the Library of the late John Carter Brown of Providence, R. I. With Notes by John Russell Bartlett.* 2 vols. Providence, 1875-1882.
- J.C.B. Catalogue (1919): *Bibliotheca Americana. Catalogue of the John Carter Brown Library in Brown University, Providence, Rhode Island.* 3 vols. Providence, 1919-1931.
- Kretschmer, *Portolane*: Konrad Kretschmer, "Die italienischen Portolane des Mittelalters" in: *Veröffentlichungen des Instituts für Meereskunde und des Geographischen Instituts an der Universität Berlin*, Heft 13, February, 1909.
- Lelewel: Joachim Lelewel, *Géographie du Moyen Age.* 4 vols. and atlas. Brussels, 1852.
- Lowery Collection*: Woodbury Lowery, *The Lowery Collection. A descriptive List of Maps of the Spanish Possessions within the present limits of the United States, 1502-1820.* Edited with notes by Philip Lee Phillips. Washington, 1912.
- Markham, *Quiros*: *The Voyages of Pedro Fernandez de Quiros, 1595-1606.* Translated and Edited by Sir Clements Markham. 2 vols. The Hakluyt Society, Second Series, Nos. XIV and XV. London, 1904.

- Muller II-III: *Remarkable Maps of the XVth, XVIth & XVIIth centuries reproduced in their original size.* 6 parts in 4 portfolios. Amsterdam, Frederik Muller & Cy., 1894-1897. Parts II-III. The Geography of Australia as delineated by the Dutch Cartographers of the XVIIth Century. Edited by C. H. Coote.
- Nordenskiöld, *Facsimile-Atlas*: A. E. Nordenskiöld, *Facsimile-Atlas to the Early History of Cartography with Reproductions of the most important Maps printed in the XV and XVI Centuries.* Translated from the Swedish Original by Johan Adolf Ekelöf and Clements R. Markham. Stockholm, 1889.
- Nordenskiöld, *Periplus*: A. E. Nordenskiöld, *Periplus. An Essay on the Early History of Charts and Sailing-Directions, translated from the Swedish Original by Francis A. Bather.* Stockholm, 1897.
- Phillips, *Atlases: A List of Geographical Atlases in the Library of Congress with Bibliographical Notes.* Compiled under the Direction of Philip Lee Phillips. 4 vols. Washington, 1909-1920.
- Rainaud: Armand Rainaud, *Le Continent austral.* Paris, 1893.
- Ravenstein: E. G. Ravenstein, *Martin Behaim, his Life and his Globe.* London, 1908.
- Sabin: Joseph Sabin, *A Dictionary of Books relating to America, from its Discovery to the present Time.* 29 vols. New York, 1868-1936.
- Schoff, *Periplus: The Periplus of the Erythraean Sea. Travel and Trade in the Indian Ocean by a Merchant of the first Century.* Translated from the Greek and Annotated by Wilfred H. Schoff. New York, 1912.
- Stevens, *Notes*: Henry Stevens, *Historical and Geographical Notes on the earliest Discoveries in America, 1453-1530.* New Haven and London, 1869.
- Stevenson, *Canerio*: Edward Luther Stevenson, *Marine World Chart of Nicolò de Canerio Januensis 1502 (circa) A critical Study with Facsimile.* Issued under the joint Auspices of the American Geographical Society and the Hispanic Society of America. New York, 1908.
- Stevenson, *Globes*: Edward Luther Stevenson, *Terrestrial and Celestial Globes their History and Construction.* 2 vols. New Haven and London, 1921.

- Stevenson, *Maps: Maps illustrating early Discovery and Exploration in America 1502-1530 reproduced by Photography from the Original Manuscripts. Issued under the Direction of Edward Luther Stevenson.* 12 parts. New Brunswick, New Jersey, 1903.
- Stevenson, *Ptolemy: Geography of Claudius Ptolemy translated into English and edited by Edward Luther Stevenson. With an Introduction by Professor Joseph Fischer, S. J.* The New York Public Library, New York, 1932.
- Teleki: Paul, Graf Teleki, *Atlas zur Geschichte der Kartographie der Japanischen Inseln.* Budapest, 1909.
- Tooley: R. V. Tooley, "Maps in Italian Atlases of the Sixteenth Century," pp. 12-47 in: *Imago Mundi III*, London, 1939.
- Wagner, *Agnese*: Henry R. Wagner, "The Manuscript Atlases of Battista Agnese," pp. 1-110 in: *The Papers of the Bibliographical Society of America*, Vol. 25, 1931.
- Wagner, *Cartography*: Henry R. Wagner, *The Cartography of the Northwest Coast of America to the Year 1800.* 2 vols. Berkeley, California. 1937.
- Wagner, *Spanish Voyages*: Henry R. Wagner, *Spanish Voyages to the Northwest Coast of America in the Sixteenth Century.* San Francisco, 1929.

LIST OF PRINCIPAL MAPS MENTIONED
IN THE TEXT *

c. 150. PTOLEMAEUS, CLAUDIUS. *Geographia*.

The earliest recorded manuscripts of Ptolemy's "Geographical Guide" are in the Greek language and are the product of copyists of the eleventh century. The earliest manuscripts in Latin, the translation of Jacobus Angelus, are of the fifteenth century. One of these of about 1460, the *Codex Ebnerianus*, owned by The New York Public Library, has its twenty-six sectional maps on the projection devised by Donnus Nicolaus Germanus. This Donnus or "Donis" projection is employed in the printed editions of 1478, 1490, 1507, 1508, and others of later date. In 1932 The New York Public Library issued the *Geography of Claudius Ptolemy*. Translated into English and edited by Edward Luther Stevenson . . . Including Reproductions of the Maps from the Ebner Manuscript, ca. 1460. With an Introduction by Professor Joseph Fischer, S. J.

Nordenskiöld's *Facsimile-Atlas* gives full consideration to the Ptolemaic atlas. Wilberforce Eames in Sabin, Nos. 66469-66508, sets forth authoritatively the descriptive bibliography of the printed editions. For a comprehensive view of the writings of several hundred years about Ptolemy's Geography, the reader is referred to the manuscript "Bibliography of Cartography" in the Division of Maps, Library of Congress. See the present list, Nos. 13 and 15, for editions pertinent to the present study. (1)

894. BEATUS OF LIEBANA. [Rectangular world map.]

In Beatus, *Super Apocalypsim*. Libri, Ashburnham, Yates-Thompson ms., now Morgan ms. 644, date uncertain but either 894, 896, or 926. Leaf measures 15 x 11 1/16 inches.

Ref. De Ricci & Wilson, II. 1477; Konrad Miller, *Mappa-mundi. Die ältesten Weltkarten. I. Heft: Die Welt-Karte des Beatus*, Stuttgart, 1895.

Rep. See Plate II in this work.

Location: The Pierpont Morgan Library, New York. (2)

* In this list locations are not invariably given if more than three copies of a map are known.

The abbreviation Ref. means Reference; Rep. stands for Reproduced.

1154. EDRISI, ABOU ABDALLAH MOHAMMED BEN MOHAMMED EL. [World map of 1154 A.D.]

Rectangular map made by the Arabian geographer to accompany his work entitled *Nazezat al Mosehtak* . . . , that is, "The Diversion of the Man who wants to know all the Countries of the World." This is not the round map on a silver plate mentioned in our text.

Ref. Lelewel, I. 92-107, et passim; Konrad Miller, *Explanations to the proof of the Map of the World drawn by Idrisi in 1154 and restored by K. Miller in 1927*; Taras Borodajkewycz, *Konrad Millers Lebenswerk*, Salzburg, 1936 (German and English text); Nordenskiöld, *Periplus*, passim. For editions of the text of Edrisi's geographical work in Arabic and Latin, see Jacques-Charles Brunet, *Manuel du Libraire*, 6 vols., Paris, 1860-1865, II, Edrisi. See also list of references appended to article "Idrisi" in *Encyclopaedia Britannica*, 11th ed.

Rep. *Charta Rogeriana Weltkarte des Idrisi vom Jahr 1154 n.Ch., Wiederhergestellt und herausgegeben von Konrad Miller*, Stuttgart, 1928, accompanied by *Explanations*, cited above.

Location: Bodleian; Bibliothèque Nationale, Paris. (3)

1220. BEATUS OF LIÉBANA. [Oval world map.]

In Beatus, *In Apocalypsim*. Morgan ms. No. 429.

Ref. De Ricci & Wilson, II. 1447.

Location: The Pierpont Morgan Library, New York. (4)

1320. VESCONTE, PETRUS. [Circular world map.]

In an atlas of Petrus Vesconte in the Vatican Library.

Ref. Kretschmer, *Portolane*, pp. 110-117, specifically 112, No. 8; Nordenskiöld, *Periplus*, passim, but especially pp. 56-58.

Rep. Nordenskiöld, *Periplus*, figure 6, p. 17.

Location: Vatican Library (*Codex Palatinus*, n. 1362). (5)

- c. 1321. SANUDO, MARINO. [Circular world map of the Petrus Vesconte type.]

The atlas of Petrus Vesconte (see No. 5 of this list) was added to many manuscript copies of Sanudo's *Liber secretorum fidelium crucis*, completed about 1321 as Crusade propaganda.

Ref. Lelewel, II. 19-34; Kretschmer, *Portolane*, pp. 113-116, No. 9; Nordenskiöld, *Periplus*, passim, but especially pp. 56-58.

Rep. Nordenskiöld, *Fascimile-Atlas*, figure 28, and *Periplus*, figure 20.

Location: Vatican Library (*Codex Vaticanus*, lat. membr. n. 2972); British Museum; and other libraries specified by Kretschmer in work cited above, pp. 113-114. (6)

1351. ATLANTE MEDICEO or PORTOLANO LAURENZIANO-GADDIANO. [World map.]

Ref. Kretschmer, *Portolane*, pp. 119-121, No. 14; G. H. T. Kimble, "The Laurentian world map with special reference to its portrayal of Africa," in *Imago Mundi I*, pp. 29-33; Nordenskiöld, *Periplus*, p. 58.

Rep. African portion reproduced in Nordenskiöld, *Periplus*, p. 21, and the same portion in Kimble, cited above, showing later additions to the map.

Location: Biblioteca Laurentiana, Florence. (7)

1375. CATALAN ATLAS.

Ref. Lelewel, II. 37-67; Nordenskiöld, *Periplus*, pp. 58-59, and p. 25, note 2, where reference is made to a photographic reproduction, and pp. 25-44, where its legends are compared with those of other portolan atlases of the fourteenth, fifteenth, and sixteenth centuries.

Rep. Nordenskiöld, *Periplus*, plates XI-XIV.

Location: Bibliothèque Nationale, Paris. (8)

1436. BIANCO, ANDREA. [Atlas.]

Ref. Kretschmer, *Portolane*, pp. 130-131, No. 33; Nordenskiöld, *Periplus*, p. 61; Lelewel, II. 84-89.

Rep. The world map is reproduced in Nordenskiöld, *Periplus*, p. 19.

Location: Biblioteca Marciana, Venice. (9)

1452. [Stefano Borgia Museum map, a circular world map of uncertain authorship, incised in copper.]

Ref. Lelewel, II. 96-103; Nordenskiöld, *Periplus*, p. 141, et passim.

Rep. Nordenskiöld, *Periplus*, Plate XXXIX.

Location: Museum of Cardinal Stefano Borgia, Velletri. (10)

1457. GENOESE WORLD MAP, 1457.

Ref. E. L. Stevenson, *Genoese World Map 1457 Facsimile and Critical Text incorporating in free Translation the Studies of Professor Theobald Fischer revised with the Addition of copious Notes*, issued under the joint auspices of The American Geographical Society and The Hispanic Society of America, New York, 1912.

Rep. Accompanying Stevenson, work cited above.

Location: Central National Library of Florence. (11)

1459. FRA MAURO. [Circular world map.]

Ref. Kretschmer, *Portolane*, p. 140, No. 51; Lelewel, II. 89-96; Nordenskiöld, *Periplus*, pp. 62-63, 140-141, et passim; Cortesão, *Cartografia*, I. 121-125.

Rep. Four nineteenth-century reproductions and redrawings cited by Nordenskiöld in *Periplus*, p. 62.

Location: Biblioteca Marciana, Venice. (12)

1462. PTOLEMAEUS, CLAUDIUS. *Cosmographia*. See under 1477.

1477. PTOLEMAEUS, CLAUDIUS. [World map.]

In *Cosmographia*, Bologna, 1477; misdated 1462.

Ref. For determination of the date see L. Sighinolfi, "I mappamondi di Taddeo Crivelli e la stampa bolognese della Cosmografia di Tolomeo," in *La Bibliofilia*, X, 7a, 1908, pp. 241-269. A fine monograph on this edition of Ptolemy is Edward Lynam, *The First Engraved Atlas of the World*, The George H. Beans Library, Jenkintown, Pennsylvania, 1941. Nordenskiöld, *Facsimile-Atlas*, pp. 10 and 12; Eames in Sabin No. 66471.

Rep. The maps in Lynam, work cited above, are reproduced by photostat from the copy belonging to George H. Beans, Jenkintown, Pennsylvania.

Location: Of some twenty copies which can be located only three are in American libraries, namely, The New York Public, The Pierpont Morgan, and The John Carter Brown. Mr. Beans has a set of the maps in proof state, without the text. (13)

1480. RÜST, HANS. [Circular world map, woodcut.] Augsburg, [1475-1482].

Ref. *Check List of Fifteenth Century Printing in The Pierpont Morgan Library*, New York, 1939, p. 3; W. L. Schreiber, *Handbuch der Holz- und Metallschnitte des XV Jahrhunderts*, Leipzig, 1927, IV,

Nos. 1950 and 1950a; Schreiber, *Die Holzschnitte im Besitz der The Pierpont Morgan Library in New York*, Strasbourg, 1929; H. Haslinger, "Deutsche Weltkarten-Inkunabeln," in *Zeitschrift der Gesellschaft für Erdkunde zu Berlin*. 1927. Nr. 9/10.

Rep. Schreiber, *Die Holzschnitte*, cited above.

Location: The Pierpont Morgan Library and The National Gallery of Art (Rosenwald Collection), Washington. (14)

1482. PTOLEMAEUS, CLAUDIUS. [World map.]

In *Cosmographia*, Ulm, 1482.

Ref. Nordenskiöld, *Facsimile-Atlas*, pp. 14-16; Eames in Sabin, No. 66472.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XXIX; Plate I in this work.

Location: Widely distributed. The Ayer copies of the book in The Newberry Library of Chicago have textual variations, and the John Carter Brown copies have variations in the world map described by Henry N. Stevens in his *Ptolemy's Geography . . . now the property of Edward E. Ayer*, London, 1908, pp. 28-34. (15)

1483. MACROBIUS, AURELIUS THEODOSIUS. [World map.]

In his *In Somnium Scipionis expositio*, Brescia, 1483.

Ref. Rainaud discusses at length this sixth-century map, first printed in 1483.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XXXI; Plate III in this work.

Location: In American libraries: Annmary Brown Memorial; Chapin Library in Williams College; and Harvard. (16)

1492. BEHAIM, MARTIN. MARTIN BEHAIM'S ERDAPFEL, 1492. [Gores of the Behaim Globe as reconstructed by Ravenstein.]

Ref. This manuscript globe is mentioned or fully discussed as a matter of course in most works on historical cartography, as, for example, Cortesão, *Cartografia*, I. 126-135. An extensive monograph which takes into consideration previous studies is E. G. Ravenstein, *Martin Behaim his Life and his Globe*, London, 1908.

Rep. The reconstructed globe gores in full size referred to in the title entry accompany Ravenstein, work cited above, as a detached illustration.

Location: Germanic Museum, Nuremberg. (17)

- c. 1492. MARTELLUS GERMANUS, HENRICUS. [World map, manuscript, constructed 1489-1492.]
 Ref. Nordenskiöld, *Facsimile-Atlas*, p. 57; Nordenskiöld, *Periplus*, p. 128.
 Rep. Nordenskiöld, *Periplus*, p. 123.
 Location: British Museum. (18)
1500. COSA, JUAN DE LA. [World map, manuscript.]
 Ref. Nordenskiöld, *Periplus*, p. 149; HARRISSE, *Discovery*, pp. 412-415, et passim; George E. Nunn, *The Mappemonde of Juan de la Cosa*, The George H. Beans Library, Jenkintown, Pennsylvania, 1934.
 Rep. Nordenskiöld, *Periplus*, Plates XLIII and XLIV; *Frontières entre le Brésil et la Guyane Française, Mémoire . . .* Paris, 1899-1900 (Phillips, *Atlases*, No. 2719, item 1).
 Location: Naval Museum, Madrid. (19)
- c. 1502. CANERIO JANUENSIS, NICOLO DE. [World map, manuscript.]
 Ref. Stevenson, *Canerio*; HARRISSE, *Discovery*, pp. 428-430; Nordenskiöld, *Periplus*, p. 150; Cortesão, *Cartografia*, I. 142-155.
 Rep. Facsimile in full size accompanying Stevenson, *Canerio*.
 Location: Archives du Service Hydrographique de la Marine, Paris. (20)
1502. CANTINO, ALBERTO. CARTA DA NAUIGAR PER LE ISOLE NOUAM^{TE} TR IN LE PARTE DE L'INDIA. [World map, manuscript.]
 This anonymous map was the gift of Alberto Cantino to the Duke of Ferrara.
 Ref. Nordenskiöld, *Periplus*, pp. 149-150, et passim; HARRISSE, *Discovery*, pp. 422-425; Stevenson, *Maps*; Cortesão, *Cartografia*, I. 142-155.
 Rep. Stevenson, *Maps*, No. 1.
 Location: Biblioteca Estense, Modena. (21)
- c. 1502. [King-Hamy-Huntington chart, an anonymous world map in manuscript.]
 Ref. J. T. E. Hamy, "Notice sur une mappemonde portugaise anonyme de 1502," in *Bulletin de Géographie historique et descriptive*,

1886, Paris, 1887, No. 4; HARRISSE, *Discovery*, page 431; NORDENSKIÖLD, *Periplus*, pp. 128-129, 149; CORTESÃO, *Cartografia*, I. 176-177, et passim.

Rep. Nordenskiöld, *Periplus*, Plate XLV.

Location: The Henry E. Huntington Library. (22)

1506. CONTARINI, GIOVANNI MATTEO. [World map, engraved by Francesco Roselli, Florence (?), 1506.]

Ref. J. A. J. de Villiers, *A Map of the World designed by Gio. Matteo Contarini*, London, The British Museum, 1924; Caraci, passim.

Rep. Villiers, work cited above.

Location: British Museum. (23)

1507. WALDSEEMÜLLER, MARTIN. UNIVERSALIS COSMOGRAPHIA SECUNDUM PTHOLOMAEI TRADITIONEM ET AMERICI VESPUCHII ALIORUMQUE LUSTRATIONES. St. Dié or Strasbourg, 1507.

Ref. Fischer and Wieser; H. N. Stevens, *The First Delineation of the New World*, London, 1928, passim; Correspondence between Elizabeth B. Nugent and George B. Parks in *Philological Quarterly*, XVII. 251-262, and in *Publications of the Modern Language Association*, LVII. 74-88, and LVIII. 572-574.

Rep. Fischer & Wieser; also their *Die Weltkarten Waldseemüllers*, Innsbruck, 1903, facsimile in 12 sheets.

Location: Wolfegg Castle, Würtemberg. (24)

- 1507 or 1508. RUYSCH, JOANNES. UNIVERSALIOR COGNITI ORBIS TABULA... [Engraved world map on a conical projection.]

Commonly found in Ptolemaeus, *Geographia*, Rome, 1508.

Ref. HARRISSE, *Discovery*, pp. 449-453; NORDENSKIÖLD, *Facsimile-Atlas*, pp. 18, 63-67; Caraci, passim; Villiers, work cited under No. 23, passim. Both HARRISSE and NORDENSKIÖLD wrote their comments before the historical importance of this map was somewhat lessened by the discovery of the Waldseemüller map of 1507. See also EAMES in SABIN, No. 66476, and manuscript notes by him laid in The John Carter Brown Library copy of the Ptolemy of 1508, distinguishing for the first time the three states of the map through the discovery of its first state in the Ptolemy of 1507 in the library of the late Grenville Kane.

Rep. 2nd state in STEVENSON, *Ptolemy*; 3rd state in NORDENSKIÖLD, *Facsimile-Atlas*, Plate XXXII.

Location: 1st state, Estate of Grenville Kane; 2nd state, The Library of Congress and The George H. Beans Library, Jenkintown, Pennsylvania; 3rd state, found in many libraries. (25)

- 1507-1510. WALDSEEMÜLLER, MARTIN (?) [The Hauslab-Liechtenstein printed globe goes.]

Ref. Stevenson, *Globes*, I. 69-73; Fischer & Wieser, p. 14; Har-
risse, *Discovery*, pp. 467-468; Section II, note 4, the present work.

Rep. By Prince Liechtenstein under the title, *Erster gedruckter Globus. Martin Hylacomylus (Waltzemüller). Gehört wahrscheinlich zu seinem 1509 herausgegebenen Buche Globus Mundi*, [Vienna], 1879. See also reduced reproductions in works cited above.

Location: Hauslab-Liechtenstein Collection, Vienna. (26)

- c. 1510. GLAREANUS, HENRICUS. [Manuscript world map and northern and southern hemispheres.]

Ref. "Antonii Elter P.P.O. de Henrico Glareano geographo et antiquissima forma 'Americae' commentatio," in *Natalicia Regis Augustissimi Guilelmi II* . . . Bonn, [1896]; Nordenskiöld, *Periplus*, p. 178.

Rep. Elter, work cited above; Nordenskiöld, *Periplus*, p. 173.

Location: University Library, Bonn. (27)

- c. 1510. GLAREANUS, HENRICUS. [Manuscript world map and western hemisphere.]

Ref. Eugen Oberhummer, "Zwei handschriftliche Karten des Glareanus in der Münchener Universitätsbibliothek," in *Jahresbericht der Geographischen Gesellschaft in München*, Heft 14, 1892; Nordenskiöld, *Periplus*, p. 152.

Rep. Oberhummer, work cited above; Elter, work cited in foregoing entry; and the western hemisphere in Nordenskiöld, *Periplus*, p. 185.

Location: University Library, Munich. (28)

- c. 1510-1520. GLAREANUS, HENRICUS. [Six manuscript maps, including northern and southern hemispheres.]

In the John Carter Brown Library codex containing Glareanus's treatises, *De Geographia* and *De Asse Compendium*.

Ref. Sotheby, Wilkinson & Hodge, *Catalogue*, June 27-28, 1912, No. 400; Edward Heawood, "Glareanus: his Geography and

Maps," in *The Geographical Journal*, June, 1905. See also *The Royal Engineers' Journal* for June, 1905, and September, 1908; *Annual Report*, The John Carter Brown Library, 1913, pp. 19-20.

Rep. Northern hemisphere in color in Heawood, cited above. Reduced outline drawings of all six maps of the manuscript are found in *The Royal Engineers' Journal* for September, 1908. Northern and southern hemispheres, Plates V and VI in this work.

Location: The John Carter Brown Library. (29)

1510. LENOX GLOBE. [Engraved on copper.]

Ref. Nordenskiöld, *Facsimile-Atlas*, p. 75, where are given references to articles by B. F. de Costa in the *Magazine of American History*, September, 1879, and Gabriel Gravier in *Bulletin de la Société Normande de Géographie*, 1870; Nordenskiöld, *Periplus*, p. 150; Stevenson, *Globes*, I. 73-74; Henry Stevens, *Recollections of Mr. James Lenox*, London, 1886, Chapter XVII.

Rep. Stevenson, *Globes*, I, facing p. 72, and on a plane in Nordenskiöld, *Facsimile-Atlas*, p. 75.

Location: The New York Public Library. (30)

1511. MAGGIOLO, VESCONTE [World map, manuscript, dated Naples, 20 January, 1511.]

In a manuscript atlas of Vesconte Maggiolo, 1511.

Ref. Caraci; Harris, *Discovery*, pp. 468-469; *Catalogue de la Bibliothèque de M. Ricardo Heredia*, III. 5-6; *Annual Report*, The John Carter Brown Library, 1913, p. 19.

Rep. Caraci, in full size; in Heredia Sale Catalogue, noted above, reduced.

Location: The John Carter Brown Library. (31)

1511. SYLVANUS, BERNARDUS. [World map on a cordiform projection.]

In *Claudii Ptolemaei . . . liber geographiae*, Venice, 1511.

Ref. Nordenskiöld, *Facsimile-Atlas*, pp. 18-19, 68, 87-88, et passim; Bagrow, II. 82-83; Eames in Sabin, No. 66477.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XXXIII. (32)

1512. STOBNICZA, JOANNES DE. [World map in eastern and western hemispheres.]

These wood-engraved hemispheres, copied from the insets on the Waldseemüller world map of 1507, are printed back to back on a single sheet in three of the four known copies. This sheet accompanies Stobnicza's *Introductio in Ptholomei Cosmographiam*, Cracow, 1512.

Ref. Avrahm Yarmolinsky, *Early Polish Americana*, The New York Public Library, 1937, pp. 15-30; Nordenskiöld, *Periplus*, p. 151, et passim; Nordenskiöld, *Facsimile-Atlas*, pp. 68-69, et passim; *Annual Report*, The John Carter Brown Library, 1928-1929, pp. 28-31; J.C.B. Catalogue (1875), No. 45; Sabin, No. 91866; E. P. Goldschmidt, Catalogue XVIII, London, No. 172. See *Lowery Collection*, No. 8, for other references.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XXXIV; J.C.B. Catalogue (1875), opposite item No. 45; western hemisphere, Plate IV in this work.

Location: Bavarian State Library, Munich; National Library, Vienna (map printed on two sheets); State and University Library, Breslau; The John Carter Brown Library. (33)

1513. [WALDSEEMÜLLER, MARTIN]. TABULA MODERNA INDIAE.

In *Claudii Ptolemei . . . Geographie*, Strasbourg, 1513. *Supplementum*.

Ref. Bagrow, II. 97-104; Eames in Sabin, No. 66478.

Rep. Nordenskiöld, *Facsimile-Atlas*, figure 10; Plate VIII in this work. (34)

1513. [WALDSEEMÜLLER, MARTIN]. ORBIS TYPUS UNIVERSALIS JUXTA HYDROGRAPHORUM TRADITIONEM.

In *Claudii Ptolemei . . . Geographie*, Strasbourg, 1513. *Supplementum*.

Ref. Bagrow, II. 97-104; Eames in Sabin, No. 66478; H. N. Stevens, *The First Delineation of the New World*, London, 1928, which describes another edition of this map from a different woodblock and bearing the name "America" owned by The John Carter Brown Library. For discussion of Stevens's theory that this John Carter Brown map antedated the Waldseemüller map of 1507 and of his other claims for it, see L. C. Karpinski, "The First Map with the Name America," in *The Geographical Review*, XX, No. 4, October, 1930; E. P. Goldschmidt, "Johannes Cochlaeus and a Problem in sixteenth-century Cartography," in *The Geographical Journal*,

LXXXII, No. 4, October, 1933; and W. M. Peitz, "Die erste Darstellung der Neuen Welt," in *Petermanns Mitteilungen*, 76 Jahrgang, 1930, pp. 295-301.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XXXV; Stevens, work cited above; Plate VII in this work (in part only). (35)

c. 1515. SCHÖNER, JOHANN. [Printed globe.]

Probably published in connection with his book, *Luculentissima quaedam Terrae totius Descriptio*, Nuremberg, 1515.

Ref. Harrisse, *Discovery*, pp. 484-489; Henry Stevens, *Johann Schöner*, London, 1888; Stevenson, *Globes*, I. 83-85. See *Lowery Collection*, No. 11, for other references.

Rep. Western half in Stevens, work cited above, Figure 3; Stevenson, *Globes*, Figure 43 (much reduced).

Location: Grand Ducal Library at Weimar; City Museum, Frankfurt. (36)

c. 1515. GREEN GLOBE. [Painted wooden sphere.]

Ref. Harrisse, *Discovery*, pp. 489-491; Stevenson, *Globes*, I. 76-77. See *Lowery Collection*, No. 10, for other references.

Rep. Stevenson, *Globes*, Figure 38.

Location: Bibliothèque Nationale, Paris. (37)

1516. WALDSEEMÜLLER, MARTIN. CARTA MARINA NAVIGATORIA PORTUGALLEN NAVIGATIONES. [St. Dié?]

Ref. Fischer & Wieser, *passim*.

Rep. Fischer & Wieser; also their *Die Weltkarten Waldseemüllers*, Innsbruck, 1903, facsimile in 12 sheets.

Location: Wolfegg Castle, Württemberg. (38)

1520. APIAN, PETER. TIPUS ORBIS UNIVERSALIS IUXTA PTOLOMEI COSMOGRAPHI TRADITIONEM ET AMERICI VESPUCCI ALIORUMQUE LUSTRATIONES . . . An. Do. MDXX.

In Gaius Julius Solinus, *Ioannis Camertis . . . Solini Polyhistora*, Vienna, 1520.

Ref. F. Van Ortroy, *Bibliographie de l'Oeuvre de Pierre Apian*, Besançon, 1902, No. 1; Bagrow, I. 30-36.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XXXVIII; J.C.B. Catalogue (1875), opposite item No. 64. (39)

1529. RIBERO, DIEGO. CARTA UNIVERSAL EN QUE SE CONTIENE TODO LO QUE DEL MUNDO SE HA DESCUBIERTO FASTA AGORA, HIZOLA DIEGO RIBERO COSMOGRAPHO DE SU MAGESTAD: Año de 1529. e Sevilla.

Ref. J. G. Kohl, *Die beiden ältesten General-Karten von Amerika*, Weimar, 1860; Nordenskiöld, *Periplus*, p. 155; HARRISSE, *Discovery*, pp. 569-575; Cortesão, *Cartografia*, II. 145-151, et passim; and numerous other references in *Lowery Collection*, No. 31.

Rep. From the original in the Archives of the Propaganda in Rome, by W. Griggs, London; American section in Kohl, work cited above; Stevenson, *Maps*, No. 11.

Location: Archives of the Propaganda, Rome; Grand Ducal Library, Weimar. (40)

- c. 1529. FRANCISCUS MONACHUS. [World map in eastern and western hemispheres.]

In his *De Orbis Situ*, [Antwerp, 1529].

Ref. HARRISSE, *Discovery*, pp. 544-553; Nordenskiöld, *Periplus*, pp. 153-154, et passim; Bagrow, II. 17-19. For date of book, see Wouter Nijhoff, *L'Art Typographique dans les Pays-Bas . . . 1500 à 1540*, La Haye, 1902-1926, livraison XXX-XXXIII, pp. 20-22. L. Gallois, *De Orontio Finaeo*, Paris, 1890, reprints the entire book.

Rep. Nordenskiöld, *Periplus*, p. 98, and frequently elsewhere; Plate IX of this work. (41)

1530. FRIES, LAURENT. CARTA MARINA UNIVERSALIS EMENDATA ET VERITATI RESTITUTA A LAURENTIO FRISIO ANNO 1530.

A redrawing of the Waldseemüller *Carta marina* of 1516 with legends translated into German. Published by Johann Grüninger of Strasbourg.

Ref. Bagrow, I. 72-73.

Rep. *Carta marina universalis 1530*, Ludwig Rosenthal's Antiquariat, Munich, [1926].

Location: Bavarian State Library, Munich. (42)

1532. FINÉ, ORONCE. NOVA, ET INTEGRA UNIVERSI ORBIS DESCRIPTIO.

Published at the expense of Christian Wechel of Paris in July, 1531. It may have been published separately though it is ordinarily found as part of the Grynaeus, *Novus Orbis*, of Paris, 1532.

Ref. L. Gallois, *De Orontio Finaeo*, Paris, 1890; Bagrow, I. 65-66; Nordenskiöld, *Facsimile-Atlas*, pp. 90, 106; Harrisse, *Discovery*, pp. 582-585.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XLI; Gallois, work cited above; Stevens, *Notes*, Plate III. (43)

1534. [RAMUSIO, GIOVANNI BAPTISTA.] LA CARTA UNIVERSALE DELLA TERRA FERMA & ISOLE DELLE INDIE OCCIDENTALI . . . Venice, 1534.

In Martyr and Oviedo, *Summario de la Generale Historia de l'Indie Occidentali* (Harrisse, *B.A.V.* No. 190), said by Harrisse in his *Discovery of North America* to have been edited by Ramusio.

Ref. Harrisse, *Discovery*, pp. 596-598; Nordenskiöld, *Facsimile-Atlas*, pp. 106-107; Stevens, *Notes*, p. 51; *Annual Report*, The John Carter Brown Library, 1928-1929, pp. 25-28.

Rep. Stevens, *Notes*, Plate II; Nordenskiöld, *Facsimile-Atlas*, Figure 67; Justin Winsor, *Narrative and critical History*, Boston and New York, 1886, II. 223. Plate X in this work.

Location: The New York Public Library; The John Carter Brown Library. (44)

1538. MERCATOR, GERHARD. [World map on the double cordiform projection.]

Ref. Bagrow, II. 4-5.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XLIII, and elsewhere as specified by Bagrow in the reference cited above.

Location: American Geographical Society, New York City; The New York Public Library. (45)

1540. MÜNSTER, SEBASTIAN. NOVAE INSULAE . . . NOVA TABULA.

In Ptolemy, *Geographia*, Basle, 1540.

Ref. Bagrow, II. 25. For additional references see *Lowery Collection*, No. 46.

Rep. A. L. Humphreys, *Old Decorative Maps and Charts*, London and New York, 1926, Plate 5. (46)

1542. AGNESE, BATTISTA. [Manuscript portolan atlas.]

The specific reference in the text is to the atlas dated May 15, 1542, in The Pierpont Morgan Library, New York.

Ref. Wagner, *Agnese*; Wagner, *Cartography*, I, where special reference to the Pierpont Morgan Atlas occurs on pp. 21-23.

Rep. In Wagner, *Agnese*, a typical Agnese Atlas is reproduced. *Collection Frédéric Spitzer. Portulan de Charles-Quint donné à Philippe II accompagné d'une Notice explicative par MM. F. Spitzer et Ch. Wiener*, Paris, 1875, contains a photographic reproduction of the atlas now owned by The John Carter Brown Library. (47)

1544. CABOT, SEBASTIAN. [World map, printed, Antwerp (?), 1544 (?).]

Ref. Bagrow, I. 53; Fite & Freeman, pp. 61-63. See *Lowery Collection*, No. 44, for numerous further references.

Rep. E. F. Jomard, *Les Monuments de la Géographie*, Paris, [1842-1862], map 20, cited in *Lowery Collection*, No. 44. Also reproduced on a very small scale in Fite & Freeman, p. 60.

Location: Bibliothèque Nationale, Paris. (48)

1546. GASTALDI, GIACOMO. UNIVERSALE. Venice, 1546.

Ref. Stefano Grande, *Le Carte d'America di Giacomo Gastaldi*, Turin, 1905, Chapter XVIII, pp. 97-106; Bagrow, I. 76-77; Tooley, No. 3; Nordenskiöld, *Facsimile-Atlas*, passim.

Rep. Muller, *Remarkable Maps*, IV.

Location: Copy in The John Carter Brown Library is in an earlier state than that reproduced by Muller and generally seen. (49)

- c. 1553? [Anonymous Portuguese planisphere in the Dépôt Hydrographique de la Marine.]

Ref. HARRISSE, *Découverte et Évolution cartographique de Terre-Neuve*, pp. 233-234, but especially Cortesão, *Cartografia*, I. 159-161, where are given many references and a discussion of the probability that the map must be dated after 1566; Teleki, p. 23.

Rep. In part in Teleki, Plate III, No. 2.

Location: Dépôt Hydrographique de la Marine, Paris. (49a)

- c. 1560. SALAMANCA, ANTONIO DE. [Double-cordiform map of the world in northern and southern halves, copied from the Mercator cordiform world map of 1538.] Rome, c. 1560.

Ref. Tooley, No. 1; Bagrow, II. 5; Nordenskiöld, *Facsimile-Atlas*, p. 118, No. 9, p. 90, and Figure 54, refers to the second issue of the map (Tooley, No. 2) bearing the name of Antonio Lafreri.

Rep. Photostat in *Antonio Salamanca's Version of Mercator's World Map of 1538*, by George E. Nunn. The George H. Beans Library, Jenkintown, Pennsylvania, 1933. The Lafreri issue is reproduced in Nordenskiöld, *Facsimile-Atlas*, Figure 54.

Location: The George H. Beans Library, Jenkintown, Pennsylvania; The John Carter Brown Library. (50)

c. 1566. ZALTIERI, BOLOGNINO. IL DISEGNO DEL DISCOPERTO DELLA NOVA FRANZA.

A later issue bears the imprint: Venetijs, aeneis formis Bolognini Zalterij Anno MDLXVI.

Ref. Bagrow, I. 92, II. 41; Tooley, Nos. 80 and 81; *Lowery Collection*, No. 53; G. E. Nunn, *Origin of the Strait of Anian Concept*, Philadelphia, 1929, pp. 33-36; Wagner, *Cartography*, II. No. 69; Fite & Freeman, pp. 73-74.

Rep. (Second issue) Nordenskiöld, *Facsimile-Atlas*, p. 129; Fite & Freeman, No. 21. (First issue) George E. Nunn, work cited above and Plate XI in this work. *Lowery Collection*, No. 53, records other reproductions.

Location: Second issue, widely distributed. First issue, The George H. Beans Library, Jenkintown, Pennsylvania; The John Carter Brown Library; various European libraries specified in the location of copies by Tooley and by Wagner, works cited above. (51)

1568. VAZ DOURADO, FERNÃO. UNIVERCALES. ET INTEGRA TOTIUS ORBIS . . . Goa, 1568.

One of several known manuscript atlases in the Portuguese tradition by the celebrated cartographer, Vaz Dourado. This earliest dated specimen is entered here because it contains the sectional map of Japan mentioned in our text as the first known European map of that island and Korea.

Ref. Wagner, *Cartography*, II, No. 72; Cortesão, *Cartografia*, II. Chapter VII, especially pp. 28-41. For a section on the work and the influence of Vaz Dourado, see Wagner, *Cartography*, I. 60-67.

Rep. Plates XXV-LI in Cortesão, *Cartografia*, reproduce maps from Vaz Dourado atlases of various dates from about 1568, but chiefly from the atlas of 1571 in the Torre do Tombo, Lisbon.

Location: The atlas of 1568 here described is in the possession of the Duke of Alba, Madrid. One undated atlas is in the Henry E. Huntington Library. For the location of others see Cortesão, *Cartografia*, II. 26, and Wagner, *Cartography*, I. 60. (51a)

1569. GASTALDI, GIACOMO. COSMOGRAPHIA UNIVERSALIS ET EXACTISSIMA IUXTA POSTREMAM NEOTERICORUM TRADITIONEM. Venice, Giovanni Francesco Camozio, 1569.

Ref. Wagner, *Cartography*, II, No. 74, but particularly George H. Beans, *A Large World Map dated 1569 . . . now in the George H. Beans Library*, Philadelphia, 1933.

Rep. Photostat facsimile in Beans, work cited above.

Location: Biblioteca Nacional, Madrid; and The George H. Beans Library, Jenkintown, Pennsylvania, formerly in possession of Lloyds, Trieste. (51b)

1569. MERCATOR, GERHARD. NOVA ET AUCTA ORBIS TERRAE DESCRIPTIO. AD USUM NAVIGANTIIUM EMENDATE ACCOMMODATA. Duisburg, 1569.

Ref. Bagrow, II, 8-10; Wagner, *Cartography*, II, No. 75; see *Lowery Collection*, No. 55, for the large literature on this first chart on the Mercator projection.

Rep. E. F. Jomard, *Les Monuments de la Géographie*, Paris [1842-1862], XXI; *Drei Karten . . . Facsimile-lichtdruck . . . von der Gesellschaft für Erdkunde zu Berlin*, 1891; Fite & Freeman, No. 22 (very greatly reduced).

Location: Bibliothèque Nationale, Paris; State Library, Breslau; University Library, Basle; and one copy in private hands recorded by Bagrow. (52)

1570. ORTELIUS, ABRAHAM. AMERICAЕ SIVE NOVI ORBIS, NOVA DESCRIPTIO.

In Ortelius, *Theatrum Orbis*, Antwerp, 1570.

Ref. Bagrow, I, 13.

Rep. A. L. Humphreys, *Old Decorative Maps and Charts*, London, 1926, Plate 9. (53)

1570. ORTELIUS, ABRAHAM. TYPUS ORBIS TERRARUM.

In Ortelius, *Theatrum Orbis*, Antwerp, 1570.

Ref. Bagrow, I, 13, see *Lowery Collection*, No. 56, for a list of titles relating to Ortelius; Wagner, *Cartography*, II, No. 82.

Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XLVI; see Wagner, *Cartography*, II, No. 82, for other reproductions. (54)

- c.1575. LÓPEZ DE VELASCO, JUAN. DEMARCACION Y NAVEGACIONES DE YNDIAS. [Manuscript map].

Ref. This general map of the East and West Indies is one of fourteen found in copies of the López de Velasco manuscript, *Demarcacion y Division de las Yndias* (first printed, but without maps, in *Colección de Documentos Inéditos . . . de América y Oceanía*, Vol. XV, Madrid, 1871, pp. 409-572). This work, *Demarcacion y Division*, is a summary, made after 1574, of the author's *Geografía y Descripción Universal de las Indias*, which seems to have been prepared without maps. The larger work was published under the above title, edited by Don Justo Zaragoza, at Madrid in 1894. The summary, or *Demarcacion*, was utilized by Herrera for the section in the *Historia general*, of 1601, entitled "Descripción de las Indias Occidentales," with which were published the fourteen maps of the *Demarcacion y Division*. See Zaragoza, work cited, Introduction; *Annual Report*, The John Carter Brown Library, 1936, pp. 10-13; Wagner, *Cartography*, I. 66-67.

Rep. See statement above concerning the use of the maps by Herrera. The general map here entered is reproduced in the present work, Plate XII, from the copy of the manuscript in The John Carter Brown Library.

Location: Manuscripts in the Biblioteca Nacional, Madrid; Provincial Library, Toledo; Archives of the Indies, Seville; The John Carter Brown Library; and another reported in private ownership in Spain in 1894. (55)

- c.1575. LÓPEZ DE VELASCO, JUAN. DESCRIPCION DE LAS YNDIAS DEL PONIENTE. [Manuscript map.]

Ref. See under No. 55.

Rep. See under No. 55 and reproduction in the present work, Plate XIII.

Location: See under No. 55. (56)

1587. ORTELIUS, ABRAHAM. TYPUS ORBIS TERRARUM. [In lower right-hand corner] Ab. Ortelius describ. cum privilegio decennali, 1587.

In Ortelius, *Theatrum Orbis*, of 1590 and later editions, but it may have been published separately in 1587.

Ref. Wagner, *Cartography*, II, No. 148.

Rep. Plate XIV in this work. (57)

1587. ORTELIUS, ABRAHAM. AMERICAE SIVE NOVI ORBIS, NOVA DESCRIPTIO. Cum Privilegio decennali Ab. Ortelius delineab. et excudeb. 1587.
Ref. Wagner, *Cartography*, II, No. 147. (58)
1587. HAKLUYT, RICHARD. NOVUS ORBIS. Paris, 1587.
In Hakluyt's edition of Peter Martyr's *De Orbe novo*, Paris, 1587.
Ref. Wagner, *Cartography*, I, 82-83; II, No. 145; G. B. Parks, *Richard Hakluyt and the English Voyages*, New York, 1928.
Rep. Nordenskiöld, *Facsimile-Atlas*, Figure 82; Parks, work cited above, Figure 20; Stevens, *Notes*, Plate 3; and others referred to in Wagner, *Cartography*, II, No. 145. (59)
1590. JODE, CORNEILLE DE. HEMISPHERIUM AB AEQUINOCTIALI LINEA, AD CIRCULUM POLI ARCTICI, and HEMISPHERIUM . . . AD CIRCULUM POLI ANTARCTICI.
Probably published separately in 1590. Reissued in 1593 with Corneille de Jode, *Speculum*, of Antwerp of that year, where it appears with printed text on the back of the northern hemisphere.
Ref. Wagner, *Cartography*, II, Nos. 161 and 170.
Rep. Nordenskiöld, *Facsimile-Atlas*, Plate XLVIII. (60)
1594. PLANCIUS, PETER. ORBIS TERRARUM TYPUS DE INTEGRO MULTIS IN LOCIS EMENDATUS AUCTORE PETRO PLANCIO 1594.
In J. H. van Linschoten, *Itinerario*, 1596.
Ref. Wagner, *Cartography*, II, No. 174; Tiele, *Mémoire*, p. 92, note; Church Catalogue, No. 252; Linschoten-Vereeniging, XXXIX, the works of Linschoten, third volume, *Itinerario*, introduction, pp. xxxi-xxxiii; idem, XLIII, vierde deel, introduction, pp. xxii-xxiv. See also Wagner, *Cartography*, II, No. 184, and other references cited above for the copy of this map by Joan Baptista Vrient found in many copies of Linschoten, *Itinerario*, 1596.
Rep. Linschoten-Vereeniging, XLIII, cited above. (61)
1595. TEIXEIRA, LUIZ. IAPONIAE INSULAE DESCRIPTIO. LUDOICO TEISERA AUCTORE. CUM . . . PRIVILEGIO DECENNALI. 1595.
In Ortelius, *Theatrum*, Antwerp, 1595.
Ref. Teleki, p. 35; J. H. Hessels, ed., *Ecclesiae Londino-Batavae Archivum*, 3 vols., Cambridge, 1887-1897, I. xxxiv, xlix; Cortesão, *Cartografia*, II. 266-268.
Rep. Teleki, p. 34. (62)

1596. LINSCHOTEN, JAN HUYGHEN VAN. EXACTA & ACCURATA
DELINEATIO . . . IN REGIONIBUS CHINA, CAUCHINCHINA . . .
SUMATRA, JAVA . . . TIMORA, MOLUCCAE, PHILIPPINAE . . .
INSULAE JAPAN & COREA . . .

Ref. Linschoten Vereeniging, XLIII, the works of Linschoten,
Itinerario, vierde deel, introduction, pp. xxv-xxvi.

Rep. Work cited above, and Plate XV in this work. (63)

- c. 1599. WRIGHT, EDWARD. . . A TRUE HYDROGRAPHICAL DE-
SCRIPTION OF SO MUCH OF THE WORLD AS HATH BEEN HETHER-
TO DISCOVERED . . .

In Hakluyt's *Principal Navigations*, 3 vols., London, 1598-1600.
Commonly referred to as the Wright-Molyneux or the Molyneux
map.

Ref. *The Voyages and Works of John Davis* (Hakluyt Society, No.
LIX), London, 1880, "Note on the 'New Map'," by C. H. Coote,
pp. lxxxv-xcv; E. J. S. Parsons and W. F. Morris, "Edward
Wright and his Work," in *Imago Mundi III*, pp. 61-71.

Rep. First state in *Voyages and Works of John Davis*, cited above;
second state in Hakluyt's *Principal Navigations* (James MacLehose,
Glasgow, and Hakluyt Society), 1903, I; Nordenskiöld, *Facsimile-
Atlas*, Plate L. (64)

1600. VAN NECK, JACOB CORNELISZ. TABULA ITINERARIA
OCTO NAVIUM DUCTORE IACOBO CORNELIO VAN NECK QUAE
AROMATIBUS DIVERSIS . . . 1600. BENIAMIN WRIGHT COELATOR.

Ref. Muller, II-III, Notes, Part II, No. 2.

Rep. Work cited above. (65)

1605. [HALL, JOSEPH, Bishop of Norwich]. [Terra Australis In-
cognita, and four sectional maps: Crapulia, Viraginia, Moronia,
Lavernia.]

In Joseph Hall, *Mundus alter et idem*, Frankfurt, c. 1605. *Short-Title
Catalogue*, No. 12685, suggests that the imprint is false and that it
was a London publication of H. Lownes.

Ref. *The Discovery of a new World*, edited by Huntington Brown,
Cambridge, 1937.

Rep. Work cited above. (66)

1618. SCHOUTEN, WILLEM CORNELISZ. CAARTE VANDE ZUYDZEE . . .

In *Journal . . . van de wonderlicke reyse ghedaen door Willem Cornelisz Schouten van Hoorn . . . 1615. 1616. en 1617*, Amsterdam, 1618.

A similar map, with a more detailed map of the northern New Guinea coast as an inset, is found with the section "Australische Navigatien, ontdeckt door Iacob le Maire," in Joris van Spielbergen, *Oost ende West-Indische Spiegel*, Leyden, 1619. See *The East and West Indian Mirror*, edited by J. A. J. de Villiers (Hakluyt Society, 2nd Series, No. XVIII), London, 1906. (67)

1621. NODAL, BARTOLOMÉ GARCÍA DE, and GONÇALO DE. RECONOCIMIENTO DE LOS ESTRECHOS DE MAGALLANES Y SAN VICENTE . . . ECHA POR DON PEDRO TEIXEIRA EALBERNAS COSMOGRAPHO DE SU MGD. I de Courbes Sculpsit.

In B. G. and G. de Nodal, *Relacion del Viaje . . . Hixieron . . . al descubrimiento del Estrecho nuevo de S. Vicente*, Madrid, 1621.

Ref. "Voyage of the Captains . . . Nodal to the Straits of Le Maire," in Sir Clements Markham, *Early Spanish Voyages to the Strait of Magellan* (Hakluyt Society, 2nd Series, No. XXVIII), London, 1911. Markham says, pp. 186 and 189, that the Nodals themselves drew this map despite the fact that they had a cosmographer, Diego Ramírez, with them. He cites no authority for this statement.

Rep. Work cited above. (68)

- c.1623. DE LEEUW, ARENT MARTENSZ. [New Guinea and the eastern shore of the Gulf of Carpentaria. Manuscript chart.]

Ref. Muller, II-III, Introduction, Part II, No. 5.

Rep. Muller, II-III, Part II, No. 5.

Location: Rijks Archief, The Hague. (69)

1627. GERRITSZ, HESSEL. CAERT VAN'T LANDT VAN D'EENDRACHT UYT DE IOURNALEN ENDE AFTEYKENINGEN DER STIERLUYDENT'SAMENGESTELT, AO. 1627 . . .

Ref. Muller, II-III, Introduction, Part II, No. 4.

Rep. Muller, II-III, Part II, No. 4.

Location: Rijks Archief, The Hague. (70)

1630. ECKEBRECHT, PHILIP. NOVA ORBIS TERRARUM DELINEATIO. *See under* 1658.

1633. HONDIUS, HENRICUS. NOVA TOTIUS TERRARUM ORBIS GEOGRAPHICA AC HYDROGRAPHICA TABULA AUCT. HENR. HONDIO... 1630.

In Gerhard Mercator and Jodocus Hondius, *Atlas ou Représentation du Monde universel*, Amsterdam, 1633.

Ref. Wagner, *Cartography*, II, No. 308; Muller, II-III, Introduction, Part II, No. 6.

Rep. Muller, II-III, Part II, No. 6; and (in part) Plate XVI in this work. (71)

1640. BLAEU, WILLEM JANSZON. INDIA QUAE ORIENTALIS DICITUR, ET INSULAE ADIACENTES.

In W. J. and J. Blaeu, *Le Théâtre du Monde*, 3 vols., Amsterdam, 1638-1640.

Ref. Muller, II-III, Introduction, Part II, No. 10; Phillips, *Atlases*, No. 3421.

Rep. Muller, II-III, Part II, No. 10, and (in part) Plate XVII in the present work. (72)

1643. VRIES, MAARTEN GERRITSZ. [Anonymous manuscript chart of the voyage undertaken by Martin Gerritsz. Vries in the year 1643.]

Ref. Teleki, p. 132; for reconstruction of the Vries voyage, see pp. 109-130.

Rep. Teleki, Plate VI, and (in part) Plate XIX in this work.

Location: Rijks Archief, The Hague. (73)

1646. DUDLEY, SIR ROBERT.

ASIA CARTA DICIASETE PIU MODERNA.

(Japan and northwestern Pacific)

CARTA TERZA GENERALE DEL'ASIA.

(From Japan to the American coast)

CARTE PARTICOLARE DELLA GRANDE ISOLA DEL' GIAPONE È DI IEZO.

(Asiatic map XVII in Dudley's numeration)

CARTA PARTICOLARE DELLA PARTE ORIENTALE DEL' ISOLA DI IEZO.

(Asiatic map XVIII)

In Dudley's *Dell' Arcano del Mare*, Florence, 1646-1647, and 1660-1661.

Ref. Phillips, *Atlases*, No. 457; Stokes, *Iconography of Manhattan Island*, II. 145-148; J. C. B. Catalogue (1919), II (Part II), p. 341, and III, pp. 53-55. (74)

1647. BLAEU, WILLEM JANSZON. [Globe, 1647-1656.]

Ref. Muller, II-III, Introduction, Part III, No. 1.

Rep. Muller, II-III, Part III, No. 1, Australian portion only.

Location: Trinity House, London; British Museum (gores). (75)

1648. MAYERNE TURQUET, LOUIS DE. LA NOUVELLE MANIERE DE REPRESENTER LE GLOBE TERRESTRE. Paris, [1648].

Ref. Louis de Mayerne Turquet, *Discours sur la Carte Universelle*, Paris, 1648.

Location: A copy of the map is in The John Carter Brown Library; a copy of the *Discours* is in The Library of Congress. (76)

1649. TEIXEIRA, JOÃO. *See under 1664.*

c.1650. JANSSEN, JAN. NOVA ET ACCURATA IAPONIAE TERRAE ESONIS AC INSULARUM ADJACENTIUM. Amsterdam, c. 1650.

In Jansson's *Novus Atlas*, probably in the edition of 1650, but not verified. The John Carter Brown copy in six volumes has dates from 1652 to 1658 and the French text. The map is in Vol. III, illustrating the section "L'Isle de Japon."

Ref. *Lowery Collection*, No. 138, note. (77)

c.1652. ALLARDT, HUGO. INDIA QUAE ORIENTALIS DICITUR . . . T'AMSTERDAM, GEDRUCKT . . . HUYCH ALLARDT.

Ref. Muller, II-III, Introduction, Part III, and Supplement to Parts II and III, by J. E. Heeres.

Rep. Australian portion in work cited above, Supplement.

Location: Rijks Archief, The Hague; British Museum. (78)

c.1652. JANSSON, JAN. MAR DI INDIA.

In Jansson, *Le Grand Atlas* (fifth part), Amsterdam, 1652.

Ref. Muller, II-III, Introduction, Part II, Nos. 12 and 13.

Rep. Muller, II-III, Part II, No. 12. (79)

c.1658. ECKEBRECHT, PHILIP. NOVA ORBIS TERRARUM DELINEATIO . . . ACCOMMODATA MERIDIANO TABB. RUDOLPHI ASTRONOMICARUM . . . SUMPTUS FACIENTE JO. KEPPLERO SCULPSIT NORIMBERGAE J. P. WALCH AO. 1630.

In Kepler, *Tabulae Rudolphinae*, Ulm, 1627, 1629, and after 1658. The map in the form known today can only have been issued after 1658.

Ref. See discussion in Section VIII of the present work; Max Caspar, *Bibliographia Kepleriana*, Munich, 1936, No. 79, fixes date of the map as 1658 or after, correcting Muller II-III, Introduction, Part II, No. 8.

Rep. Muller, II-III, Part II, No. 8.

Location: Caspar, work cited above, No. 79, locates copies of the book in many European libraries, helpfully distinguishing the issues represented in each. (80)

1659. BLAEU, JOAN. ARCHIPELAGUS ORIENTALIS SIVE ASIATICUS. Amsterdam, 1659.

In J. Klencke, *Orbis Terrae Compendium*, [Amsterdam?], 1660.

Ref. Muller, II-III, Introduction, Part III.

Location: British Museum. (81)

1663. THÉVENOT, MELCHISEDECH. [Map of Australia, New Guinea, New Zealand, and Tasmania.]

In Thévenot, *Relations*, Vol. I, Première Partie, Paris, 1663.

Ref. Muller, II-III, Introduction, Part III, preliminary paragraphs and No. 7.

Rep. Muller, II-III, Part III, No. 7; Nordenskiöld, *Periplus*, p. 197; and Plate XVIII in this work. (82)

1664. TEIXEIRA, JOÃO. [Eastern section of his general chart of the Indian and Pacific Oceans. This section comprises the coasts of

China, Japan, the Philippines, and Malaysia and their contiguous waters.]

In Thévenot, *Relations*, Vol. I, Seconde Partie, Paris, 1664. Found in two states of which the earlier has no record of the Vries voyage of 1643.

Ref. Wagner, *Cartography*, I. 138, II, No. 357; J. N. Delisle, *Nouvelles Cartes*, Paris, 1753, p. 45.

Location: Both states in The Henry E. Huntington and The John Carter Brown Libraries. (83)

c. 1690. CORONELLI, VINCENZO MARIA. MARE DEL SUD.

In Coronelli, *Atlante Veneto*, Venice, 1691.

Ref. Wagner, *Cartography*, I. 135-137, II, No. 436. (84)

1696. SANSON, NICOLAS. Mappe-monde Geo-Hydrographique . . . Par le S^r Sanson . . . Dressée sur les Observations de M^{rs} de l'Académie R: des Sciences, et Principalement sur la Carte que Monsieur N. Witzen . . . a donnée au Public . . . A Amsterdam . . .

Copy here described is in Jaillot, *Atlas nouveau*, Amsterdam, [1696].

Ref. Phillips, *Atlases*, No. 524; for other editions of this map, see Wagner, *Cartography*, II, No. 426. (85)

1700. DELISLE, GUILLAUME. L'ASIE. Paris, 1700.

In Jaillot, *Atlas François*, 1695-1720.

Ref. In *Recueil de Voyages au Nord*, 1732, IV. 17-31, and in the edition of 1715 Delisle discusses the question as to whether Japan is an island. (86)

1705. DELISLE, GUILLAUME. CARTE DES INDES ET DE LA CHINE. Paris, 1705.

In Jaillot, *Atlas François*, 1695-1720.

Ref. See No. 86. (87)

1714. DELISLE, GUILLAUME. HEMISPHERE SEPTENTRIONAL. Paris, 1714.

In Jaillot, *Atlas François*, 1695-1720.

Ref. Wagner, *Cartography*, II, No. 504. (88)

1720. DELISLE, GUILLAUME, MAPPEMONDE A L'USAGE DU ROY.
... Paris ... 15^e Avril 1720.
In Jaillot, *Atlas François*, 1695-1720.
Ref. Wagner, *Cartography*, II, No. 516. (89)
1727. SCHEUCHZER, JOHAN GASPAR. IMPERIUM JAPONICUM
IN SEXAGINTA ET OCTO PROVINCIAS DIVISUM. EX IPSORUM JAPONENSIVM MAPPIS & OBSERVATIONIBUS KAEMPFERIANIS . . .
[1727].
In Engelbert Kaempfer, *The History of Japan*, translated from the original manuscript by J. G. Scheuchzer, 2 vols., London, 1727, ed. of James MacLehose and Sons, Glasgow, 3 vols., 1906.
Ref. Scheuchzer, Introduction, I. xlix-lv, and note attached to the map in Vol. III of Kaempfer's work cited above.
Rep. At end of Vol. III, work cited above. (90)
1735. [D'ANVILLE, J. B. B.]. CARTE DES PAYS TRAVERSÉS PAR LE CAP^{NE}. BEERINGS DEPUIS LA VILLE DE TOBOLSK JUSQU' À KAMSCHATKA . . .
In J. B. du Halde, *Description géographique de la Chine*, 4 v., Paris, 1735. See also D'Anville, *Nouvel Atlas de la Chine*, La Haye, 1737.
Ref. Golder, *Bering's Voyages*, I. 362; Breidfuss, p. 90; Wagner, *Cartography*, I. 156. (91)
1746. LE ROUGE, GEORGE LOUIS. L'AMERIQUE SUIVANT LE R. P. CHARLEVOIX . . . MR. DE LA CONDAMINE . . . A PARIS. PAR LE SR LE ROUGE ING. GEOGRAPHE DU ROY . . . 1746.
Ref. Phillips, *Atlases*, No. 2720.
Rep. *Frontières entre le Brésil et la Guyane française. Second Mémoire* . . . *Atlas*. Berne, 1899.
Location: Thomas W. Streeter, Morristown, N. J. (92)
1746. LOWITZ, GEORGE MAURICE. PLANIGLOBII TERRESTRIS . . . MAPPE-MONDE QUI REPRESENTE LES DEUX HEMISPHERES . . . TIRÉE DES QUATRE CARTES GENERALES DE FEU M. LE PRO-FESS: HASIUS, DRESSÉE PAR M. G. M. LOWITZ, ET PUBLIÉE PAR LES HERITIERS DE HOMANN. AVEC PRIV. . . . L'AN 1746.
Ref. Wagner, *Cartography*, II, No. 556, where it is described as No. 1 of Homann's Atlases of 1752 and 1759. Those atlases seem to have been made up of separately issued maps of various dates so

that 1746 may well be the date of publication of the Lowitz map as well as the date of its imperial privilege. (93)

1752. DELISLE, JOSEPH NICOLAS, and BUACHE, PHILIPPE. CARTE DES NOUVELLES DÉCOUVERTES AU NORD DE LA MER DU SUD . . . DRESSÉE SUR LES MÉMOIRES DE MR DE L'ISLE . . . PAR PHILIPPE BUACHE . . . ET PRÉSENTÉE À L'ACADÉMIE . . . 8 AVRIL 1750 PAR MR DE L'ISLE. SE VEND À PARIS, QUAY DE L'HORLOGE DU PALAIS, AVEC LES CARTES DE GUILL. DELISLE ET DE PHIL. BUACHE.

Ref. Wagner, *Cartography*, I. 159, II, 566; Breitfuss, p. 92, et passim; Golder, *Russian Expansion*, p. 212n.; but especially the "Avertissement" and the "Extrait des Registres de l'Académie Royale des Sciences, du 23 Janvier 1751" in Delisle, *Explication de la Carte des Nouvelles Decouvertes au Nord de la Mer du Sud*, Paris, 1752, in which the sense seems to indicate that the map was published at the same time as the *Explication* in 1752. The *Explication*, pp. 4-12, contains Delisle's report to the Académie Royale of April 8, 1750.

Rep. Teleki, Plate XIV, No. 1; Breitfuss, facing p. 92, reduced. (94)

1753. [GREEN, JOHN]. A CHART OF NORTH AND SOUTH AMERICA, INCLUDING THE ATLANTIC AND PACIFIC OCEANS . . . [LONDON] PUBLISH'D . . . FEB. 19, 1753, BY T. JEFFERYS.

Six sheets of which Nos. I and III, entitled respectively "Chart containing part of the Icy Sea" and "Chart, containing the Coasts of California, New Albion, and Russian Discoveries," are of special interest in connection with the Russian exploration of the north Pacific.

Ref. J. Green, *Remarks in Support of the New Chart of North and South America in Six Sheets*, London, Thomas Jefferys, 1753; Wagner, *Cartography*, II, No. 578, where reference is made to Henry Stevens's Catalogue of June, 1890. In the note to that entry Stevens cites Thomas Jefferys as authority for the statement that Green's real name was Bradock Mead. Wagner refers to a second edition by Jefferys of 1768. There was another in 1775. (95)

1754. BUACHE, PHILIPPE. CARTE DE L'ISLE DE IESO ET SES ENVIRONS. [Paris], 1754.

In Buache, *Considerations*, Paris, 1753.

Ref. See the index entries under "Ieso" in work cited. (96)

1754. [MÜLLER, GERHARD FRIEDRICH]. NOUVELLE CARTE DES DECOUVERTES FAITES PAR DES VAISSEAUX RUSSES AUX CÔTES INCONNUES DE L'AMERIQUE SEPTENTRIONALE . . . DRESSÉE SUR DES MEMOIRES AUTHENTIQUES DE CEUX QUI ONT ASSISTÉ A CES DECOUVERTES, ET SUR D'AUTRES CONNOISSANCES, DONT ON REND RAISON DANS UN MEMOIRE SEPARÉ. A ST PETERSBOURG A L'ACADEMIE IMPERIALE DES SCIENCES. 1754.

Ref. The "mémoire" referred to in the title is the anonymous *Lettre d'un Officier de la Marine Russe . . . Concernant la Carte des Nouvelles Découvertes au Nord de la Mer du Sud, et le Mémoire qui y sert d'Explication publié par M. de L'Isle à Paris en 1752. Traduit de l'Original Russe*, Berlin, [1753]. This tract is well known in its English form, *A Letter from a Russian Sea-Officer . . . with some Observations on that Letter by Arthur Dobbs, Esq., Governor of North Carolina*, London, 1754. For attribution of authorship of map and book to G. F. Müller, see Breidfuss, pp. 94-95, where are listed also later versions and derivatives of the map. Golder, *Bering's Voyages*, II. 6, 265, attributes, without cited evidence, both map and book to Lieutenant Sven Waxel. Wagner, *Cartography*, II, No. 591, enters the issue of 1758 without attribution of authorship. Breidfuss, p. 94, text and note 28, conveys the impression that though engraved and printed in 1754 the map was not really published until 1758. The copy here entered, however, is dated 1754. It differs from the issue of 1758 in lacking (inter alia, perhaps) the pricked line running southeasterly across the Mer d'Ochozk, marked "Route pour aller par la Mer à Kamtschatka." The form in which the Müller map is most widely known is that published by Thomas Jefferys with his *Voyages from Asia to America*, London, 1761, taken from the issue of 1758. The French copy of the map found in G. F. Müller, *Voyages et Découvertes faites par les Russes*, 2 vols., Amsterdam, 1766, was also copied from the issue of 1758.

Rep. Nordenskiöld, *Periplus*, Figure 42, and Fite & Freeman, p. 198, both reproduce the Müller map from the issue of 1758. For the 1754 issue, see Plate XX in this work.

Location: The only copy of the Müller map in the first state, dated 1754, known to the compiler is that in the collection of Thomas W. Streeter of Morristown, New Jersey. Mr. Streeter owns also a copy of the issue dated 1758.

1758. [MÜLLER, GERHARD FRIEDRICH]. NOUVELLE CARTE DES DECOUVERTES . . . See No. 97, above.

1761. JEFFERYS, THOMAS. A MAP OF THE DISCOVERIES MADE BY THE RUSSIANS ON THE NORTH WEST COAST OF AMERICA. PUBLISHED BY THE ROYAL ACADEMY OF SCIENCES AT PETERSBURG. LONDON REPUBLISHED BY THOMAS JEFFERYS . . . [1761].

In Jefferys, *Voyages from Asia to America . . . to which is prefixed A Summary of the Voyages made by the Russians on the Frozen Sea, in Search of a North East Passage. Serving as an Explanation of a Map of the Russian Discoveries . . . Translated from the High Dutch of S. Muller . . .* London, 1761, (i.e., G. F. Müller's *Sammlung Russischer Geschichte*, Vol. III, 1758).

Ref. Wagner, *Cartography*, II, No. 597.

Rep. Breitfuss, facing p. 96. (98)

1767. [DALRYMPLE, ALEXANDER]. CHART OF THE SOUTH PACIFICK OCEAN, POINTING OUT THE DISCOVERIES MADE THEREIN PREVIOUS TO 1764. PUBLISH'D ACCORDING TO ACT OF PARLIAMENT OCTO^R. 1767.

In Dalrymple, *An Account of the Discoveries made in the South Pacifick Ocean, Previous to 1764*, London, 1767. (99)

1771. BOUGAINVILLE, LOUIS DE. DÉVELOPEMENT DE LA ROUTE DES VAISSEAUX DU ROY LA BOUDEUSE ET L'ÉTOILE AUTOUR DU MONDE.

In Bougainville, *Voyage autour du Monde . . . en 1766, 1767, 1768 & 1769*, Paris, 1771, Plate I. (100)

1777. COOK, JAMES. A CHART OF THE SOUTHERN HEMISPHERE; SHEWING THE TRACKS OF SOME OF THE MOST DISTINGUISHED NAVIGATORS. BY CAPTAIN JAMES COOK OF HIS MAJESTY'S NAVY. GULIELMUS WHITCHURCH, SCULPSIT; ANNO. 1776. PUBLISHED FEBRY 1ST 1777 BY WTH STRAHAN . . . THOS. CADELL . . . LONDON.

In James Cook, *A Voyage towards the South Pole and round the World . . . 1772, 1773, 1774, and 1775*. London, 1777. For other issues, see, P. Lee Phillips, *A List of Maps of America*, Washington, 1901, p. 1093. (101)

1783. CHART SHEWING THE TRACKS OF THE SHIPS EMPLOYED IN CAPT^T COOK'S LAST VOYAGE TO THE PACIFIC OCEAN; IN THE YEARS 1776, 1777, 1778, 1779.

In John Ledyard, *A Journal of Captain Cook's last Voyage to the Pacific Ocean*, Hartford, 1783.

Ref. Maurice Holmes, *An Introduction to the Bibliography of Captain Cook*, London, 1936, No. 18, where it is said with truth that Ledyard's chart is copied from the chart in John Rickman's *Journal*, same work, No. 15.

Rep. The present work, Plate XXII.

(101a)

1784. ROBERTS, HENRY. A GENERAL CHART: EXHIBITING THE DISCOVERIES MADE BY CAPT^N. JAMES COOK IN THIS AND HIS TWO PRECEEDING VOYAGES; WITH THE TRACKS OF THE SHIPS UNDER HIS COMMAND. BY LIEUT^T. HEN^Y. ROBERTS OF HIS MAJESTY'S ROYAL NAVY. W. PALMER SCULP. Measures 21 13/16 x 36 1/8 in.

In the large folio volume containing the two charts and 61 plates belonging to James Cook and James King, *A Voyage to the Pacific Ocean*, 3 vols. quarto and one vol. large folio, London, 1784.

Ref. Wagner, *Cartography*, II, No. 699, refers to an issue without title at the top of the map and another issue of 1794, but the distinctions between them are not made clear. In addition to the edition entered above, The John Carter Brown Library has another edition, a colored map measuring 21 1/4 x 35 1/4 in., reading in the title, "By Lieut^t. Roberts . . ." instead of "By Lieut^t. Hen^y. Roberts . . .," having in the lower right, "Reference to the Colours" in two lines, and lacking the name of the engraver. (102)

1790. FLEURIEU, CHARLES PIERRE CLARET *Comte* DE. CARTE RÉDUITE DES DÉCOUVERTES DES FRANÇOIS, EN 1768 ET 1769, DANS LE SUD-EST DE LA NOUVELLE GUINÉE ÉXTRAITE D'UNE CARTE DRESSÉE PAR ORDRE DU ROI EN 1785. PUBLIÉE EN 1790, P.M.L.C.D.F.

In Fleurieu, *Découvertes des François, en 1768 & 1769, dans le sud-est de la Nouvelle Guinée*, Paris, 1790. The map was copied for the English edition, *Discoveries of the French in 1768 and 1769, to the South-east of New Guinea*, London, 1791. According to the "Nota Benè" in the lower left-hand corner the engraving was completed before April 24, 1790. The first paragraph of the "Avertissement"

reads: "Cette Carte est un Fragment d'une des Cartes manuscrites dont les Originaux sont entre les mains du Roi, et dont les Copies ont été jointes aux instructions que sa Majesté a fait expédier, le 26 Juin 1785, à M. le Comte de la Pérouse, pour le guider dans le Voyage de Découvertes, confié à sa direction."

Rep. Plate XXI in this work.

(103)

1798. ARROWSMITH, AARON. CHART OF THE PACIFIC OCEAN DRAWN FROM A GREAT NUMBER OF PRINTED AND MS. JOURNALS. BY A. ARROWSMITH, GEOGRAPHER, NO. 24 RATHBONE PLACE, LONDON, 1798. [Beneath the cartouche]: "London: Published Oct^r 1st, 1798 . . ." [Dedicated]: "To Joseph de Mendoza Rios Esq^r . . ." Nine sheets (engraved by George Allen), of which each measures $24\frac{5}{8} \times 31\frac{1}{4}$ in.

Ref. P. Lee Phillips, *A List of Maps of America in the Library of Congress*, Washington, 1901, p. 649.

(104)

LIST OF PLATES

Except where specific acknowledgment is made to The Pierpont Morgan Library, The Annmary Brown Memorial, The Library of Congress, and Mr. Thomas W. Streeter, the maps in the following list have been reproduced by permission of the Committee of Management from specimens of the originals in The John Carter Brown Library. A fuller description of each map is found in our section headed *List of Principal Maps Mentioned in the Text*. Its place in that list is indicated by the number in parentheses following each title named below.

PLATE

- I. World Map from the *Cosmographia* of Claudius Ptolemy of Ulm, 1482. (No. 15)
- II. Rectangular World Map of the Ecclesiastical Type found in the *Super Apocalypsim* of Beatus of Liébana, circa 894. Reproduced through courtesy of The Pierpont Morgan Library. (No. 2)
- III. Circular World Map from the Brescia, 1483, edition of Macrobius, *In Somnium Scipionis expositio*. Reproduced through courtesy of The Annmary Brown Memorial, Providence, Rhode Island. (No. 16)
- IV. Western Hemisphere from the World Map in Stobnicza, *Introductio*, of Cracow, 1512. (No. 33)
- V. Northern Hemisphere from the Manuscript of Glareanus, *De Geographia*, in The John Carter Brown Library. (No. 29)
- VI. Southern Hemisphere from the Manuscript of Glareanus, *De Geographia*, in The John Carter Brown Library. (No. 29)
- VII. Eastern Section of the *Orbis typus universalis* in Ptolemy's Geography of Strasbourg, 1513. (No. 35)
- VIII. The Modern Map of India in Ptolemy's Geography of Strasbourg, 1513. (No. 34)
- IX. World Map in Hemispheres from Franciscus Monachus, *De Orbis Situ*, of Antwerp, circa 1529. (No. 41)

- X. Woodcut World Map of Venice, 1534, sometimes called the "Ramusio Map." (No. 44)
- XI. Undated state of the Map of the Gastaldi Type, published by Bolognino Zaltieri in Venice, 1566. (No. 51)
- XII. General Map of the West and East Indies from the Juan López de Velasco Manuscript in The John Carter Brown Library. (No. 55)
- XIII. Sectional Map of the East Indies from the Juan López de Velasco Manuscript in The John Carter Brown Library. (No. 56)
- XIV. The *Typus Orbis Terrarum* dated 1587, from the Abraham Ortelius *Theatrum Orbis* of 1590. (No. 57)
- XV. Map of the East Indies, China, and Japan in Linschoten, *Itinerario*, Amsterdam, 1596. (No. 63)
- XVI. Section of Eastern Hemisphere in the Hendrick Hondius, *Nova totius Terrarum Orbis* . . . Amsterdam, 1633. (No. 71)
- XVII. Section of W. and J. Blaeu, *India quae orientalis dicitur* of Amsterdam, 1640. (No. 72)
- XVIII. Map of Australia, New Guinea, New Zealand, and Tasmania from Thévenot, *Relations*, Paris, 1663. (No. 82)
- XIX. Section of the chart of Martin Gerritsz. Vries's voyage of 1643. Reproduced from The Library of Congress copy of Teleki's *Atlas*. (No. 73)
- XX. The Müller map of the Northern Pacific showing the Russian Discoveries, first issue, 1754. Reproduced from the original in the library of Mr. Thomas W. Streeter. (No. 97)
- XXI. Chart of the South Pacific showing the French Discoveries in 1768 and 1769. (No. 103)
- XXII. Chart of Captain Cook's Last Voyage from John Ledyard's *Journal* of Hartford, 1783. (No. 101a)



PLATE I. World Map from the Ptolemy of 1482, showing enclosed Indian Ocean. See Section I. Original measures $16\frac{1}{2} \times 22\frac{1}{8}$ inches.

(No. 15)



PLATE II. *The Beatus Map from Morgan Ms. 644, circa 894. See Sections I and VI. Original measures 15 x 22 $\frac{1}{8}$ inches.*

DESOM.SCI.

de oceano adiecit. Qui tamē tanto nomine q̄ sit paruius uides.
 Nā licet apud nos athlaticum mare licet magnū uocetur: de ca-
 lo tamen disipicentibus nō potest magnū uideri: cū ad cælū ter-
 ra signū sit & pūctū: qđ diuidi non possit ī ptes. Ideo autē terræ
 breuitas tam diligēter asserit: ut paruipendēdum ambitū famæ



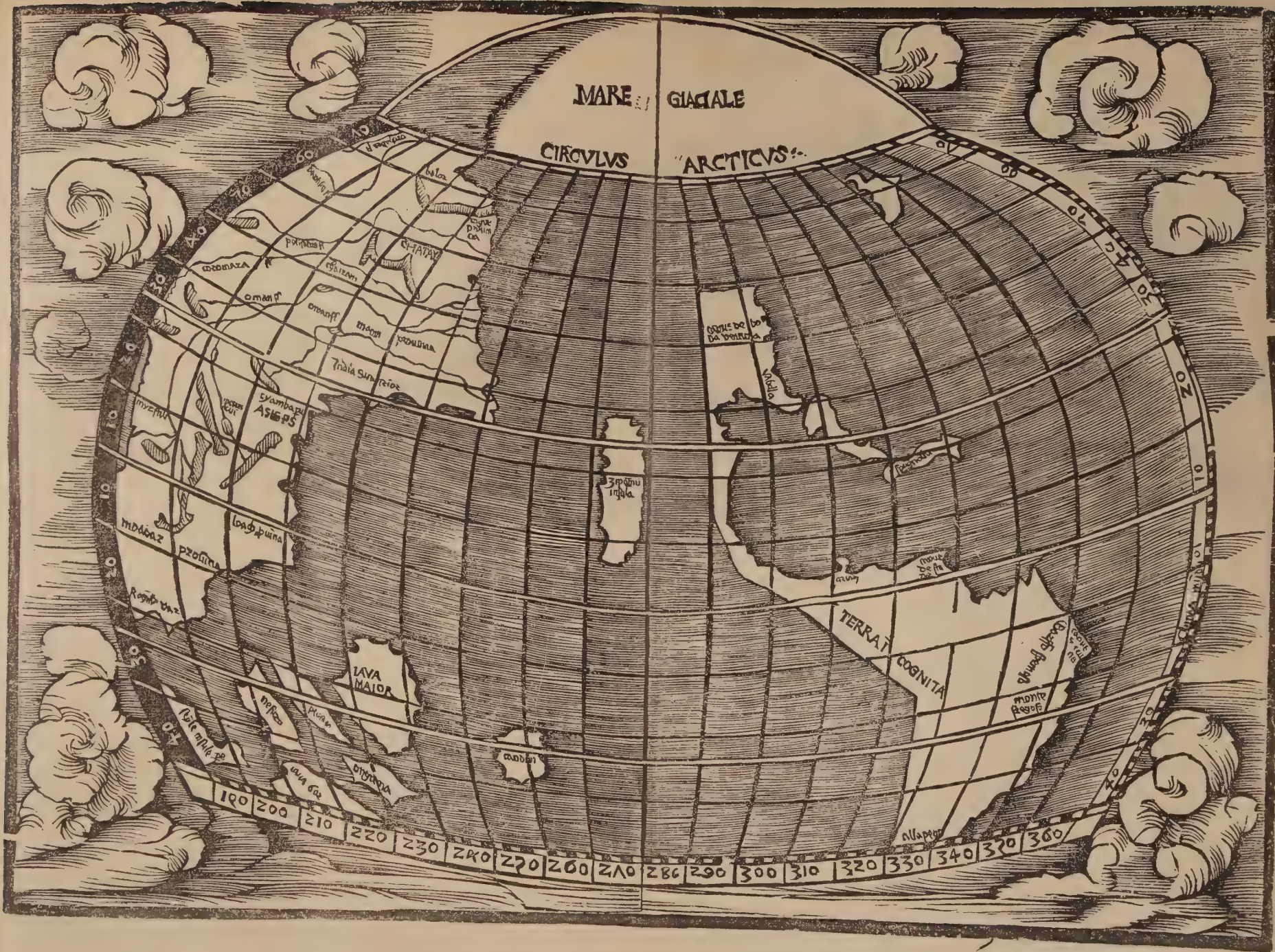
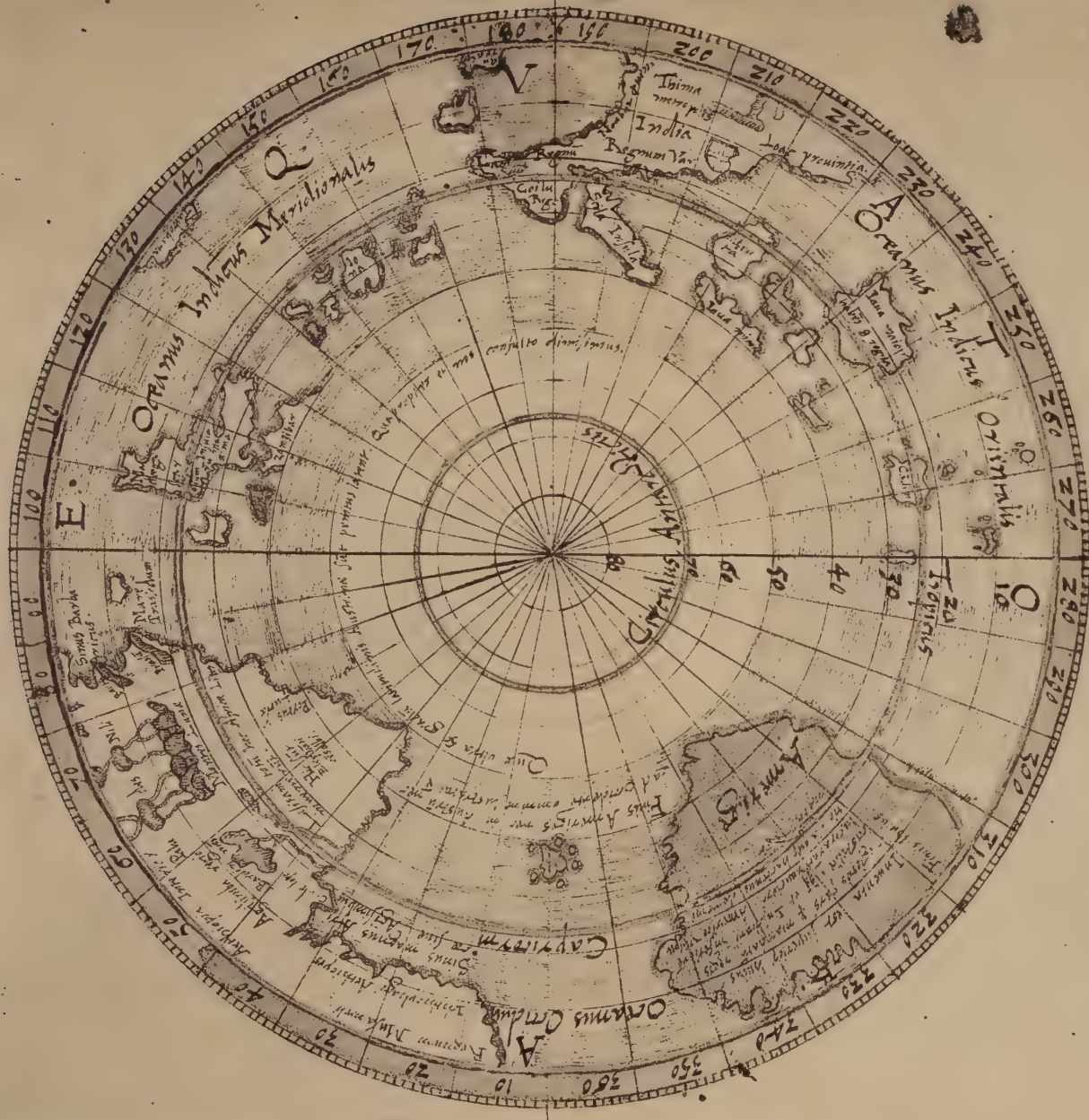


PLATE IV. The Waldseemüller-Stobnicza Western Hemisphere. See Section III. Original measures $10\frac{3}{8} \times 15$ inches.



A. b. c. d. aquator. + polus Antarcticus
 f. a. f. c. + l. f. d. quadrat. quarte meridiano
 runt a pole ad aquatorem. Iacet ergo hoc in
 quatuor hemisphaeris in planis. Cuius scilicet dextera
 posterior intelligitur, hanc inferius hemisphaerium
 est ambo circumscripta hemisphaeria ut in toto proutem





PLATE VII. Eastern Section of the supposed Waldseemüller Orbis typus universalis in the Ptolemy of 1513, showing two great peninsulas east of India. See Section III. Original map measures 17 1/4 x 22 3/8 inches. (No. 35)

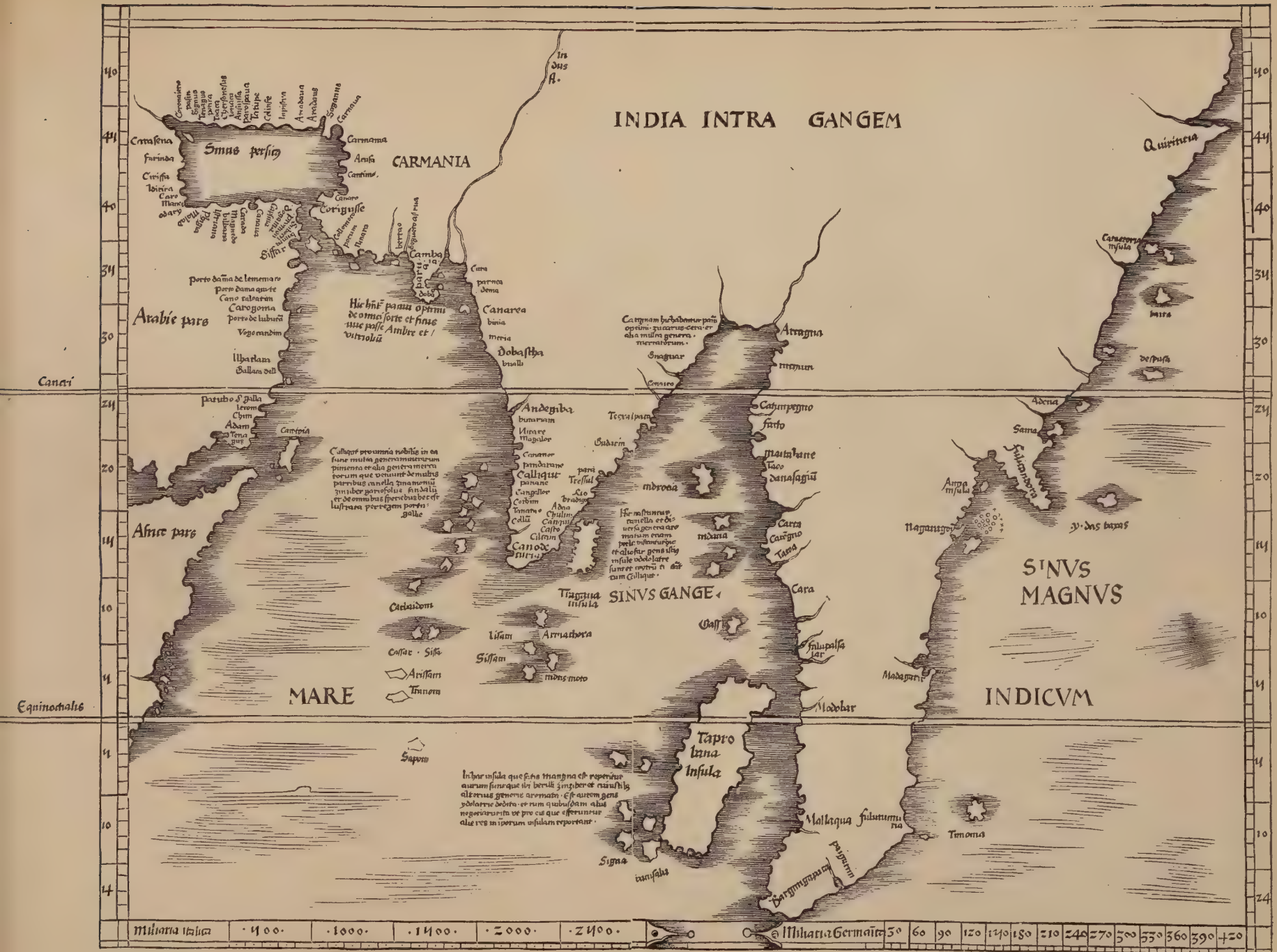


PLATE VIII. Waldseemüller's *Modern Map of India*, likewise in the Ptolemy of 1513, corrects the error of two peninsulas shown in Plate VII. See Section III. Original measures $16\frac{1}{4} \times 21\frac{3}{4}$ inches. (No. 34)

Hoc orbis Hemisphærium cedit regi Lusitaniæ.



Hoc orbis Hemisphærium cedit regi Hispaniæ.



CVM PRIVILEGIO INVICTISSIMI Romanorum imperatoris Caroli quinti, ad quinquenniū, ne quis uel typis excudat, uel excudendos curet hos codices geographicos, una cū globis, sub multa amittendorum exemplariū aliq; pena principis seueritate inferenda.

PLATE IX. The Hemispheres of Franciscus Monachus, circa 1529, showing the Strait of Magellan and the false Terra Australis. See Sections IV and VI. Actual size. (No. 41)



PLATE XII. The López de Velasco general map gives one of the earliest portrayals of the Solomons and shows in a pricked line the return route from the Philippines to Mexico. See Section VII. Double leaf measures $10\frac{1}{2} \times 13$ inches.

TYPVS ORBIS TERRARVM.

HOMI-
NES HAC LEGE
SVNT GENERATI.
QVI TYERENTVR
ILLVM GLOBVM.
QVEM IN HOC TEM-
PLO MEDIVM VI-
DES. QVAE TER-
RA DICITVR.
Cicero.

EQVVS
VEHENDI
CAVSA. ARANDI
BOS. VENANDI
ET CVSTODIENDI
CANIS. HOMO AV-
TEM ORTVS AD
MVNDVM CON-
TEMPLANDVM.
Cicero.



QVID EI POTEST VIDERI MAGNVM IN REBVS HVMANIS, CVI AETER-
NITAS OMNIS, TOTIVSQUE MVNDI NOTA SIT MAGNITVDO. CICERO:

HOC
EST PVNCTVM.
QVOD INTER TOT
GENTES FERRO
ET IGNI DIVIDI-
TVR. O QVAM RIDI-
CVLI SVNT MOR-
TALIVM TER-
MINI!
Seneca.

VTINAM
QVEMADMO-
DVM VNIVERSA
MVNDI FACIES
IN CONSPECTVM
VENIT. ITA PHI-
LOSOPHIA TOTA
NOBIS POSSET
OCCVRRERE.
Seneca.





PLATE XVI. This section of the Hondius hemisphere of 1633 contains in the upper right hand corner a part of the actual Australian coast and in its lower section the mythical Terra Australis, bridging the new knowledge and the false tradition. See Section VIII. Original hemisphere measures 11 inches in diameter. (No. 71)



PLATE XVII. The Blaeu map of 1640 records the new knowledge of the actual Australia derived from the Dutch voyages. See Section VIII. Original map in its entirety measures $17\frac{1}{4} \times 22$ inches. (No. 72)



PLATE XVIII. TheThévenot map of 1663 portrays Australia after Tasman's voyages of 1642 and 1644, virtually all that was known until Captain Cook's voyage of 1768. See Section VIII. Double leaf measures 16 x 21½ inches. (No. 82)



PLATE XXI. Fleurieu's map of 1790 in which are displayed the French discoveries of 1768 and 1769. Carried by La Perouse in 1785. See Section VII. Original measures $9\frac{1}{2} \times 13\frac{3}{4}$ inches. (No. 103)

